

This report presents the paired data for September 1991.

A revised Paired Data computer program is being used for the first time this month. The new program selects and treats pairs using somewhat different criteria than the former program and will thus produce slightly different results. The changes are designed to improve the quality of the report by enhancing the flexibility and efficiency of the computer program. Major changes are:

- Revised rejection criteria for pairs. The new criteria are based only on percent deviations from EPA and include evaporative and coastdown data in addition to emissions and fuel economy. The limits are presented below:

Parameter		New		Old	
		g/mi	%	g/mi	%
FTP HC	upper	NA	+135.0	+0.75	+135.0
	lower	NA	-100.0	-0.75	-99.0
FTPCO	upper	NA	+200.0	+6.0	160.0
	lower	NA	-100.0	-6.0	-99.0
FTP CO2	upper	NA	+15.0	+65.0	+15.0
	lower	NA	-15.0	-65.0	-15.0
FTP NOx	upper	NA	+160.0	+0.75	+100.0
	lower	NA	-100.0	-0.75	-99.0
FTP FE	upper	NA	+15.0	+3.2 mpg	+15.0
	lower	NA	-15.0	-3.2 "	-15.0
Evap.	upper	NA	+150.0	NA	NA
	lower	NA	-100.0	NA	NA
HFET CO2	upper	NA	+15.0	+45.0	NA
	lower	NA	-15.0	-45.0	NA
HFET FE	upper	NA	+15.0	+4.5 mpg	15.0
	lower	NA	-15.0	-4.5 "	15.0
HFET CDT	upper	NA	+15.0	NA	NA
	lower	NA	-15.0	NA	NA

- Mileage limits have been eliminated as a pairing criteria.
- Treatment of data has been made consistent by uniform rounding of manufacturer and EPA data.
- Missing data are treated differently to overcome MTS system restrictions.
- The Paired Data reports can now be processed as a function of laboratory, in addition to the current manufacturer based processing. This will allow better analysis of specific offsets when needed.

-2-

The data are summarized in the following attachments:

Attachment A	Monthly Paired Data Status Graphs.
Attachment B	Manufacturer Paired Data Status Graph
Attachment C	Data Presentation Methodology.
Appendix 1	Testing Summary.
Appendix 2	Absolute Differences and Percent Differences for the FTP.
Appendix 3	Absolute Differences and Percent Differences for the HFET.
Appendix 4	Evaporative Emission Data.
Appendix 5	Roadload Data.
Appendix 6	Absolute Differences and Percent Differences by Site.
Appendix 7	FTP MPG and HFET MPG Percent Differences by Reason for Confirmation.

Attachment A displays monthly means and three month running averages of data from the three months ending September 1991.

Attachment B contains monthly means and three month running averages of FTP and HFET fuel economy percent differences for Chrysler, Ford, GM and the combined averages of other manufacturers.

Attachment C presents the data stratification used and screening limits applied to data for presentation in the other attachments. The Appendices present the paired data summary statistics.

#### Conclusions:

1. Except for Ford HC, FTP emission differences are acceptable.
2. No significant fuel economy offsets were observed for either Ford or Chrysler based on the limited data available.
3. All other manufacturer's FTP and HFET fuel economy percent differences are acceptable.

#### Discussion:

##### Statistical Observations:

Table 1 lists manufacturers' offsets which exceeded the levels listed in Attachment C and showed a statistically significant difference from EPA.

-3-

Table 1  
Three Months Ending September 1991  
Percent Differences\* of Manufacturers

<u>Manufacturer</u>	<u>F T P</u>				<u>H F E T</u>			
	<u>NUM</u>	<u>HC</u>	<u>O<sub>X</sub></u>	<u>NO<sub>x</sub></u>	<u>MPG</u>	<u>NUM</u>	<u>MPG</u>	<u>NUM</u>

Ford	18	-12.7						
------	----	-------	--	--	--	--	--	--

\* Percent difference =  $((MFR-EPA)/EPA) \times 100$

No single outlier or pattern is an evident cause of Ford's offset. The absolute difference is low at -0.034 g/mi., and the typical vehicle is well below the appropriate HC standard. This is the first month for the offset.

#### Combined Manufacturer's Results:

Attachment A shows acceptable overall FTP emission running averages.

Both the FTP and HFET MPG running averages remain within +/- 1% and are acceptable.

#### Selected Manufacturers Results:

Chrysler averaged slightly greater fuel economy than EPA for three FTP tests and slightly less for three HFET tests. All of the Chrysler tests were run at JTE.

Ford averaged lower fuel economy than EPA for two FTP and two HFET tests (Excluding "UP BY 1 OR MORE"s) during the month.

Attachment B shows acceptable fuel economy and coastdown differences with the manufacturers. Chrysler's three month FTP and HFET fuel economy averages are now well within 1% of EPA. Ford's three month FTP and HFET fuel economy averages remain around positive one percent as a result of the number of vehicles with positive offsets which were tested in previous months.

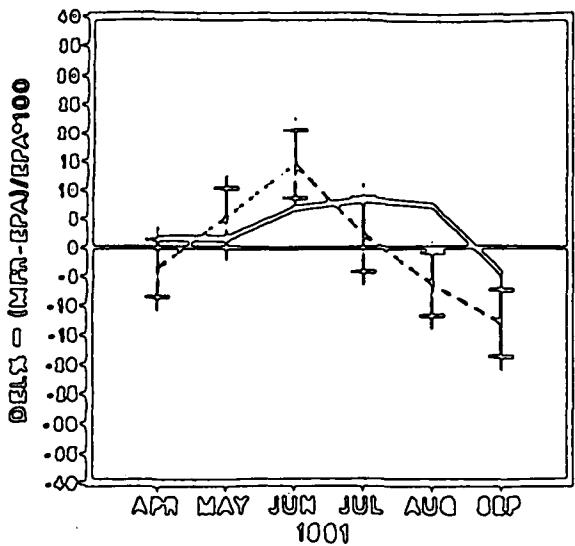
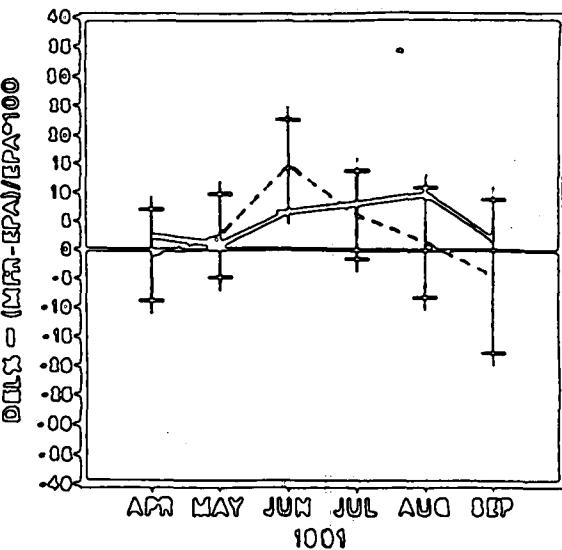
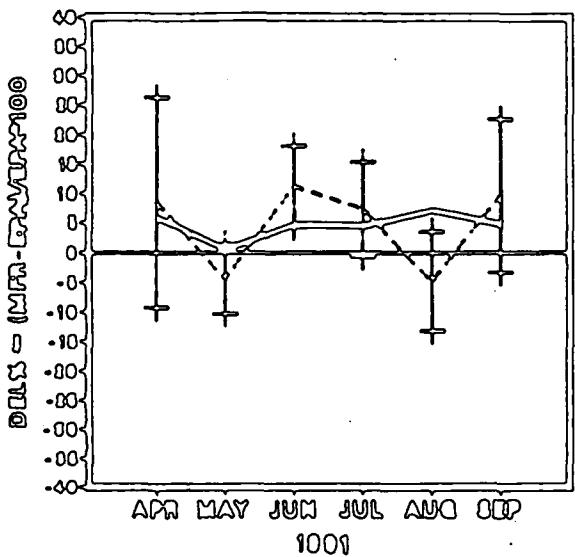
#### Paired Data Summary Statistics:

No vehicles were excluded from the summary statistics for exceeding the screening limits in Appendix C.

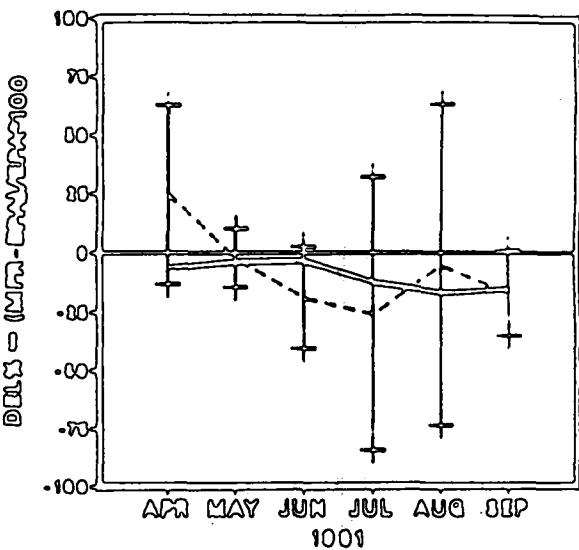
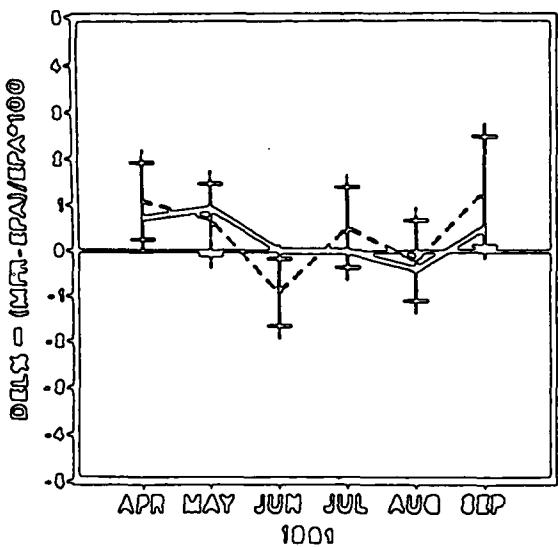
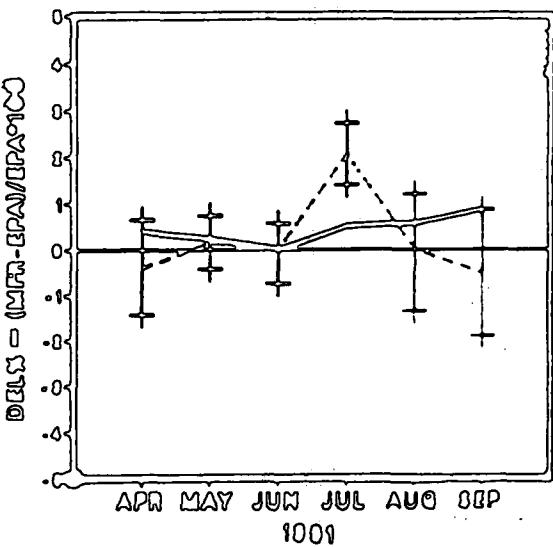
If I can be of further assistance, please call at X 8397.

#### Attachments

**ATTACHMENT A**  
**Engineering Operations Division**  
**Monthly Patrol Data Status Graphs**

**FTP HC****FTP CO****FTP NOX****EVAPORATIVE EMISSIONS**

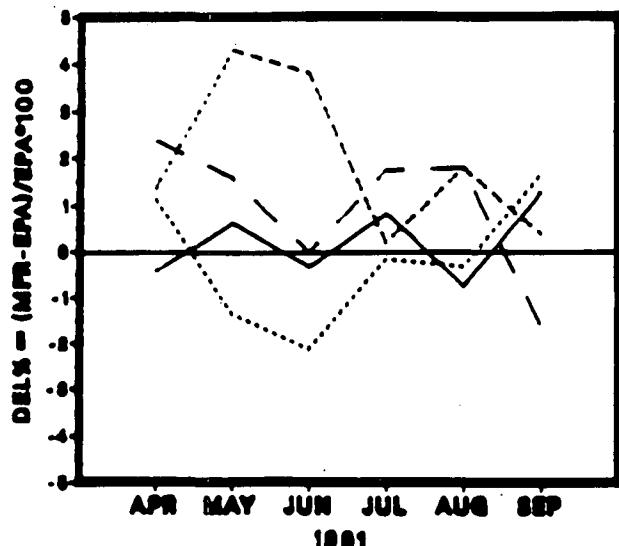
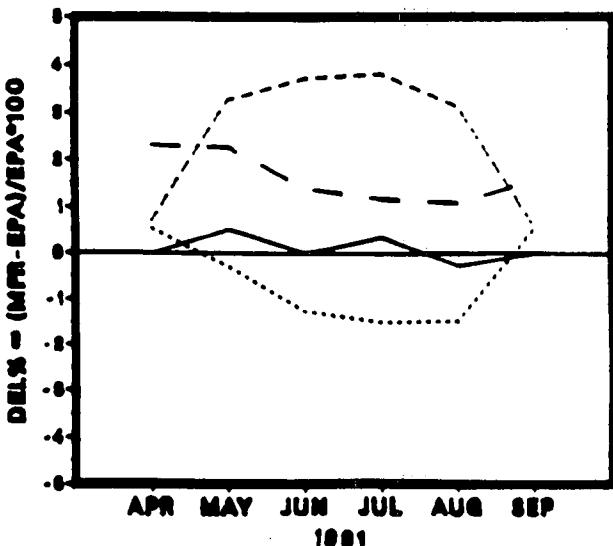
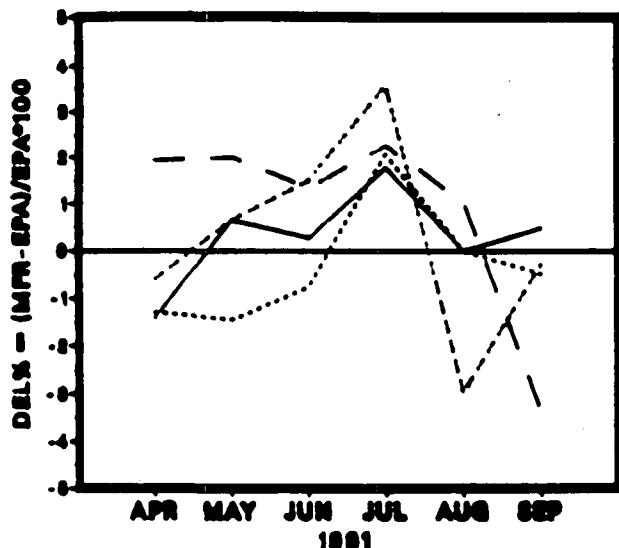
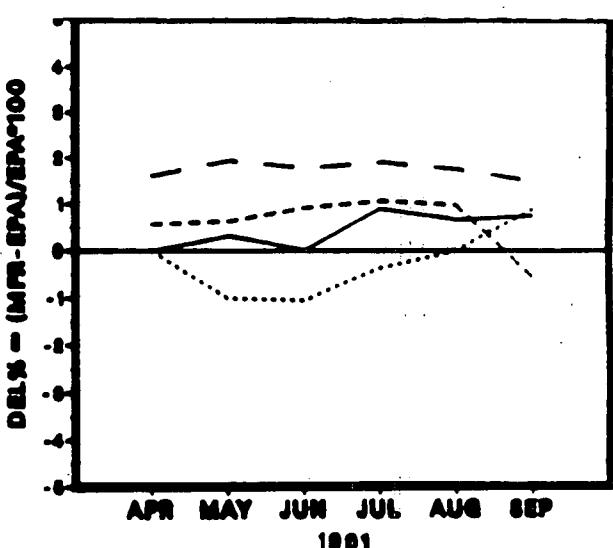
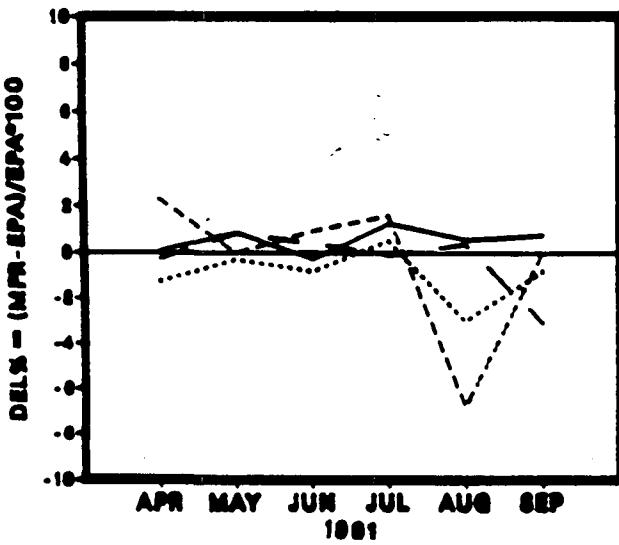
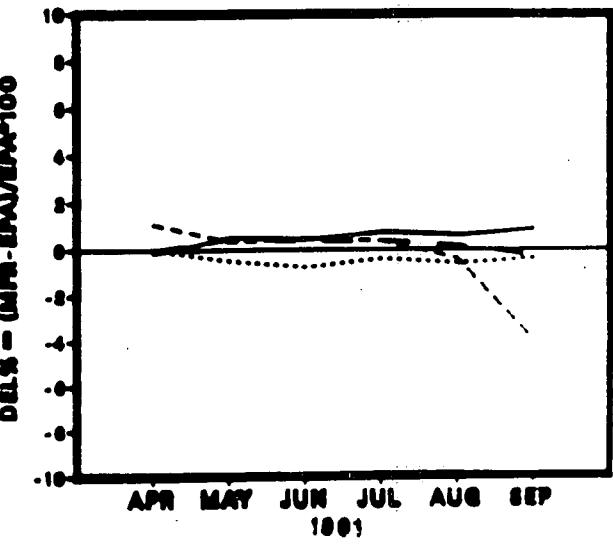
Legend  
**MONTHLY MEAN**  
**MONTHLY STANDARD DEVIATION**  
+---+ Monthly Mean  
- - - - - Standard Deviation

**FTP MM****HGET MPG**

## ATTACHMENT B

## Engineering Operations Division

## Manufacturer Paired Data Status Graphs

**FTP MPG  
MONTHLY MEANS****FTP MPG  
THREE MONTH RUNNING AVERAGE****HFMET MPG  
MONTHLY MEANS****HFMET MPG  
THREE MONTH RUNNING AVERAGE****QUICKCHECK COASTDOWN  
MONTHLY MEANS****QUICKCHECK COASTDOWN  
THREE MONTH RUNNING AVERAGE**

## Legend

- GM** \_\_\_\_\_
- FORD** \_\_\_\_\_
- GM 3/4 TON** \_\_\_\_\_
- GM OTHER...** \_\_\_\_\_

ATTACHMENT C

**Engineering Operations Division  
Data presentation Methodology**

**Table Preparation:**

Table 1 is developed using a paired t-test at the 95% confidence level. The paired t-test is based on analysis of the last test pairs with no paired data screens. All confirmation code strata are used for emission analysis, while fuel economy analysis excludes the "UP BY 1 OR MORE" reason for confirmation stratum. The table lists those tests which differ from EPA at the 95% confidence level and exceed the limits below.

HC	-10%
CO	-10%
NOx	-10%
FTP Fuel Economy	+1.5%
HFET Fuel Economy	+1.5%
Quickcheck Coastdown Time	+2.0%

**Graph Preparation:**

Attachment A emission graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE UP BY 1 OR MORE" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

**Summary Statistics Preparation:**

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

**PAIRED DATA REJECTION CRITERIA (%Δ)**

	FTP						HFET		
	HC	CO	CO <sub>2</sub>	NO <sub>x</sub>	FE	Evap	CO <sub>2</sub>	FE	CDT
UPPER	+135%	+200%	+15%	+160%	+15%	+150%	+15%	+15%	+15%
LOWER	-100%	-100%	-15%	-100%	-15%	-100%	-15%	-15%	-15%

## Appendix 1

PROCESSED: 10:38:02 OCT 30, 1991

CCID: SNBZ

PROJECT: 7030

NAME: RKG

*****	•	TTTT	EEEE	SSSS	TTTT	SSSS	0	0	M	M	SSSS
•	•	E	S	T	S	0	0	MM	MM	S	
•	PAIRED DATA ANALYSIS	•	EEE	SSSS	T	SSSS	0	0	M	M	SSSS
•	•	E	S	T	S	0	0	M	M	S	
•	SUMMARY STATISTICS	•	EEEEE	SSSSS	T	SSSS	UUU	M	M	SSSS	
•	•	E	S	T	S	0	0	M	M	S	
*****	•	TTTT	EEEE	SSSS	TTTT	SSSS	0	0	M	M	SSSS

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91 EPA

TEST TYPE(S): EMISSION DATA

FUEL ECONOMY

PAIR TYPE: EPA:MFR

ANALYZER(S): ALL

MODEL YEAR(S): ALL

DYNAMOMETER(S): ALL

FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL EVAP CLASS: EVAP AND NON EVAP

VEHICLE ADJUSTMENT: ALL VEHICLES HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

TEST PAIRS EXCEEDING QC LIMITS HAVE BEEN EXCLUDED

COMMENTS: SEPT ONLY, LAST ONLY

	FTP		HWFE	
	GAS	DIESEL	GAS	DIESEL
A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS	30	1	29	1
B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS	0	0	0	0
C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA	5	0	2	0
D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE	5	0	5	0
E. NUMBER OF VOID EPA TESTS	6	0	3	0
TOTAL NUMBER OF EPA TESTS IN THIS PERIOD	46	1	39	1
PAIRS MADE = (A+B+C)	35	1	31	1
POSSIBLE PAIRS = (A+B+C+D)	40	1	36	1
PERCENT PAIRED: ((A+B+C)/PPAIRS)*100%	87.5	100.0	86.1	100.0
PERCENT NOT PAIRED: (D/PPAIRS)*100%	12.5	0.0	13.9	0.0
	100.0	100.0	100.0	100.0

## Appendix 2

PROCESSED: 10:38:02 OCT 30, 1991

PERIOD OF ANALYSIS: 9- 1-91 TO 9-30-91

PAIR TYPE: EPA:MFR

*****	•	FFFFF	TTTTT
•	PAIRED DATA ANALYSIS	• F	T P P D D E L
•	SUMMARY STATISTICS	• FFF	T PPPP D D EEE L
•		• F	T P D D F L
*****		• FFFF	DDDD EEEEE LLLL

COMMENTS: SEPT ONLY, LAST ONLY

SIGNED DIFFERENCES: (MFR - EPA)

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	3	-0.042	0.020	3	-0.07	0.15	3	-6.0	9.5	3	-0.027	0.015	3	0.07	0.29
30 FORD	3	-0.058	0.046	3	-0.74	0.72	3	0.7	4.5	3	0.010	0.017	3	-0.03	0.35
40 GM	7	-0.019	0.028	7	0.01	0.32	7	-1.9	4.5	7	0.024	0.070	7	0.16	0.21
200 MBZ	2	0.023	0.022	2	0.04	0.20	2	4.5	9.2	2	-0.045	0.049	2	-0.20	0.14
260 HONDA	8	-0.031	0.029	8	-0.28	0.41	8	-1.6	8.4	8	0.008	0.047	8	0.05	0.41
305 JCI	1	-0.011	0.000	1	0.70	0.00	1	-8.0	0.0	1	0.010	0.000	1	-0.10	0.00
347 LIPHT	1	-0.072	0.000	1	1.42	0.00	1	13.0	0.0	1	-0.130	0.000	1	-0.60	0.00
420 PRSCH	1	0.012	0.000	1	0.28	0.00	1	-10.0	0.0	1	0.020	0.000	1	0.30	0.00
603 WETLI	2	-0.158	0.030	2	-1.48	0.42	2	2.0	8.5	2	0.085	0.049	2	0.05	0.21
640 AUDI	2	-0.030	0.005	2	-0.09	0.18	2	-3.0	8.5	2	0.020	0.014	2	0.05	0.35
ALL	30	-0.036	0.046	30	-0.17	0.63	30	-1.3	7.3	30	-0.005	0.057	30	0.03	0.31

SIGNED DIFFERENCES: (MFR - EPA)

- DIESEL ONLY -

													PARTIC.			
	200 MBZ	1	-0.065	0.000	1	0.10	0.00	1	6.0	0.0	1	0.030	0.000	1	-0.30	0.00
ALL	1	-0.065	0.000	1	0.10	0.00	1	6.0	0.0	1	0.030	0.000	1	-0.30	0.00	
														1	-0.017	0.000

## Appendix 2-b

PROCESSED: 10:38:02 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PAIR TYPE: EPA:MFR

<pre>***** ♦ PAIRED DATA ANALYSIS ♦ ♦ SUMMARY STATISTICS ♦ *****</pre>	<pre>FFFFF FFFFF PPPPP PPPPP CCCC FFFF F F F PPPPP PPPPP C C F F F P P P C C F F F P P P C C F</pre>
--	--

COMMENTS: SEPT ONLY, LAST ONLY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV												
20 CHRYS	3	-14.9	6.2	3	-4.6	7.4	3	-1.09	1.75	3	-15.0	7.1	3	0.38	1.82
30 FORD	3	-20.7	14.9	3	-14.0	18.5	3	0.25	1.17	3	16.7	28.9	3	-0.03	1.56
40 GM	7	-7.4	10.2	7	5.3	21.4	7	-0.38	0.92	7	-5.8	17.2	7	0.84	1.16
200 MBZ	2	16.4	14.3	2	-0.0	18.6	2	0.73	1.56	2	-17.6	14.1	2	-1.32	1.00
260 HONDA	8	-17.0	13.2	8	-15.6	21.5	8	-0.26	2.11	8	6.5	30.4	8	0.35	1.84
305 JCI	1	-6.0	0.0	1	64.8	0.0	1	-1.17	0.00	1	2.0	0.0	1	-0.77	0.00
347 LIPHT	1	-24.1	0.0	1	152.7	0.0	1	2.85	0.00	1	-52.0	0.0	1	-3.09	0.00
420 PRSCH	1	8.8	0.0	1	19.3	0.0	1	-2.14	0.00	1	14.3	0.0	1	1.58	0.00
603 WETLI	2	-54.1	14.5	2	-71.0	26.6	2	0.32	1.36	2	39.2	21.7	2	0.36	1.50
640 AUDI	2	-15.0	4.6	2	-5.5	12.4	2	-0.67	1.89	2	11.3	1.8	2	0.25	1.79
ALL	30	-14.0	17.7	30	-2.0	41.0	30	-0.23	1.59	30	1.6	26.0	30	0.20	1.57

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- DIESEL ONLY -

	PARTIC																		
	200 MBZ	1	-21.5	0.0	1	7.5	0.0	1	1.29	0.00	1	3.4	0.0	1	-1.38	0.00	1	-10.3	0.0
ALL	1	-21.5	0.0	1	7.5	0.0	1	1.29	0.00	1	3.4	0.0	1	-1.38	0.00	1	-10.3	0.0	

### Appendix 3

PROCESSED: 10:38:23 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PAIR TYPE: EPA:MR

*	*												
PAIRED DATA ANALYSIS			*	H	H	W	W	FFFFF	EEEE	DDDD	EEEE	I	I
*	*							F	E	D	D	E	I
SUMMARY STATISTICS			*	HHHH	WWWW	WWWW	FFF	EEE	D	D	EEE	I	I
*	*							F	E	D	D	E	I
*	*							EEEE	DDDD	EEEE	EEEE	FFFFF	FFFFF

COMMENTS: SEPT ONLY, LAST ONLY

SIGNED DIFFERENCES: (MFR - EPA)

HC			CO			CO2			NOX			MPG			
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	3	-0.043	0.009	3	-0.03	0.06	3	-1.7	9.3	3	-0.003	0.006	3	-0.07	0.55
30 FORD	3	-0.021	0.025	3	-0.10	0.11	3	6.3	5.0	3	0.030	0.046	3	-0.80	0.75
40 GM	6	-0.001	0.003	6	0.02	0.03	6	0.3	1.6	6	-0.032	0.102	6	0.10	0.28
200 MBZ	2	-0.031	0.013	2	-0.06	0.01	2	-5.5	2.1	2	0.010	0.028	2	0.10	0.14
260 HONDA	8	-0.011	0.007	8	-0.15	0.16	8	-1.3	3.4	8	-0.014	0.032	8	0.16	0.42
305 JCI	1	-0.008	0.000	1	-0.04	0.00	1	-1.0	0.0	1	0.030	0.000	1	-0.20	0.00
347 LIPHT	1	-0.274	0.000	1	-1.35	0.00	1	39.0	0.0	1	0.090	0.000	1	-4.10	0.00
420 PRSCH	1	-0.004	0.000	1	-0.02	0.00	1	-2.0	0.0	1	0.000	0.000	1	0.10	0.00
603 WETLI	2	-0.005	0.004	2	0.08	0.14	2	-3.0	9.9	2	0.070	0.014	2	0.20	0.42
640 AUDI	2	-0.022	0.025	2	-0.00	0.08	2	10.0	4.2	2	0.005	0.007	2	-1.05	0.49
ALL	29	-0.024	0.051	29	-0.10	0.27	29	1.6	9.1	29	0.002	0.058	29	-0.22	0.92

SIGNED DIFFERENCES: (MFR - EPA)

- DIESEL ONLY -															
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV			
200 MBZ	1	-0.017	0.000	1	0.07	0.00	1	2.0	0.0	1	0.030	0.000	1	-0.20	0.00
ALL	1	-0.017	0.000	1	0.07	0.00	1	2.0	0.0	1	0.030	0.000	1	-0.20	0.00

**Appendix 3-b**

PROCESSED: 10:38:23 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PAIR TYPE: EPA:MFR

<pre>***** * PAIRED DATA ANALYSIS * * SUMMARY STATISTICS * *****</pre>	<pre>H H W W FFFFF EEEEE PPPPP CCCC TTTT</pre>	<pre>H H W W FFFF EEE PPPPP CCCC TTTT</pre>	<pre>H H WW WW F EEE PPPPP CCCC TTTT</pre>	<pre>H H W W F EEEEEE PPPPP CCCC TTTT</pre>
--	--	---	--	---

COMMENTS: SEPT ONLY, LAST ONLY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV									
20 CHRYS	3	-31.5	1.7	3	-4.8	8.2	3	-0.41	2.36	3	-8.3	14.4	3	-0.29	2.44
30 FORD	3	-35.9	11.4	3	10.0	79.4	3	2.44	2.08	3	15.9	30.8	3	-2.34	2.07
40 GM	6	-8.6	13.1	6	316.5	453.8	6	0.08	0.68	6	-11.0	46.9	6	0.23	0.66
200 MBZ	2	-45.0	15.8	2	-50.0	5.4	2	-1.37	0.43	2	133.3	235.7	2	0.47	0.66
260 HONDA	8	-14.1	16.1	8	-19.1	16.7	8	-0.44	1.32	8	-14.2	53.3	8	0.50	1.22
305 JCI	1	-38.1	0.0	1	-57.1	0.0	1	-0.23	0.00	1	11.1	0.0	1	-1.00	0.00
347 LIPHT	1	-94.2	0.0	1	-85.4	0.0	1	15.00	0.00	1	128.6	0.0	1	-12.13	0.00
420 PRSCH	1	-7.5	0.0	1	-3.9	0.0	1	-0.75	0.00	1	0.0	0.0	1	0.30	0.00
603 WETLI	2	-9.4	4.1	2	146.7	301.7	2	-0.68	2.29	2	77.8	15.7	2	0.99	2.07
640 AUDI	2	-22.8	17.4	2	8.2	38.9	2	3.42	1.50	2	50.0	70.7	2	-3.46	1.58
ALL	29	-22.8	21.5	29	62.9	245.3	29	0.68	3.28	29	17.4	75.1	29	-0.67	2.81

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- DIESEL ONLY -

200 MBZ	1	-17.7	0.0	1	10.6	0.0	1	0.58	0.00	1	5.3	0.0	1	-0.68	0.00
ALL	1	-17.7	0.0	1	10.6	0.0	1	0.58	0.00	1	5.3	0.0	1	-0.68	0.00

## Appendix 4

PROCESSED: 10:38:05 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PAIR TYPE: EPA:MFR

*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
*	PAIRED DATA ANALYSIS	*	E	V	V	A	A	P	P	D	D	A	A	I	A	A
*	SUMMARY STATISTICS	*	EEE	V	V	AAAAA		PPP	PPP	D	D	AAA		I	AAAAA	
*		*	E	V	V	A	A	P		D	D	A	A	I	A	A
*		*	EEEEEE	V	A	A	P		DDDD	A	A	I	A	A		
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	

COMMENTS: SEPT ONLY, LAST ONLY

DATA AND DIFFERENCES:

	EPA GM/TEST			(M-E) DIURNAL			(M-E) H. SOAK			(M-E) TOTAL			(M-E)/E % DIFF			EPA SOAK		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	2	1.55	0.30	2	-0.98	0.02	2	0.19	0.13	2	-0.79	0.15	2	-51.1	0.0	2	20.5	2.1
30 FORD	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
40 GM	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
200 MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
260 HONDA	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
305 JCI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
347 LIPHT	1	0.76	0.00	1	0.10	0.00	1	0.15	0.00	1	0.25	0.00	1	33.3	0.0	1	17.0	0.0
420 PRSCH	1	1.52	0.00	1	-0.12	0.00	1	-0.07	0.00	1	-0.19	0.00	1	-12.5	0.0	1	19.0	0.0
603 WETL1	1	1.02	0.00	1	0.13	0.00	1	-0.18	0.00	1	-0.05	0.00	1	-4.9	0.0	1	20.0	0.0
640 AUDI	1	0.55	0.00	1	0.01	0.00	1	0.02	0.00	1	0.03	0.00	1	5.5	0.0	1	19.0	0.0
ALL	6	1.16	0.46	6	-0.31	0.53	6	0.05	0.16	6	-0.26	0.44	6	-13.5	33.0	6	19.3	1.6
BY SHED: (EPA TESTS)																		
S001	2	1.18	0.23	2	-0.42	0.78	2	0.05	0.33	2	-0.37	0.45	2	-28.0	32.7	2	21.0	1.4
S002	3	1.35	0.52	3	-0.34	0.58	3	0.06	0.12	3	-0.28	0.58	3	-10.1	42.3	3	18.3	1.2
S003	1	0.55	0.00	1	0.01	0.00	1	0.02	0.00	1	0.03	0.00	1	5.5	0.0	1	19.0	0.0
S004	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
ALL	6	1.16	0.46	6	-0.31	0.53	6	0.05	0.16	6	-0.26	0.44	6	-13.5	33.0	6	19.3	1.6

## Appendix 5

PROCESSED: 10:38:24 OCT 30, 1991

PERIOD OF ANALYSIS: 9- 1-91 TO 9-30-91

PAIR TYPE: EPA:MF

* * PAIRED DATA ANALYSIS * * SUMMARY STATISTICS *	RRRR R R 0 0 RRRR R R 0 0	000 A A D D 000 A A D D	AAA A A D D AAAAAA A A D D	DDDD D D L L D D L L D D L L	L LLLL LLLL	000 0 0 A A 0 0 A A	AAA A A D D D D D D
---	------------------------------------	----------------------------------	-------------------------------------	---------------------------------------	-------------------	---------------------------	---------------------------

COMMENTS: SEPT ONLY, LAST ONLY

COASTDOWN DATA:

### - GASOLINE TESTS -

	MFR QCHK			EPA QCHK			(MFR-EPA)			((M-E)/E)%		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
30 FORD	3	14.72	1.49	3	15.13	1.76	3	-0.40	0.28	3	-2.56	1.49
40 GM	6	17.39	2.33	6	17.34	2.19	6	0.05	0.20	6	0.20	1.26
200 MBZ	2	15.94	0.57	2	16.14	0.54	2	-0.19	0.04	2	-1.21	0.26
260 HONDA	8	15.18	0.45	8	14.76	0.41	8	0.42	0.21	8	2.84	1.46
305 JCI	1	17.63	0.00	1	17.67	0.00	1	-0.04	0.00	1	-0.23	0.00
347 LIPHT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
420 PRSCH	1	15.92	0.00	1	16.72	0.00	1	-0.80	0.00	1	-4.78	0.00
603 WETLI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
640 AUDI	2	15.56	0.07	2	16.65	0.03	2	-1.09	0.10	2	-6.54	0.58
ALL	23	15.94	1.63	23	15.98	1.67	23	-0.04	0.51	23	-0.19	3.18

COASTDOWN DATA:

### - DIESEL TESTS -

200 MBZ	1	16.55	0.00	1	16.67	0.00	1	-0.12	0.00	1	-0.72	0.00
ALL	1	16.55	0.00	1	16.67	0.00	1	-0.12	0.00	1	-0.72	0.00

## Appendix 6

PROCESSED: 10:38:05 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PAIR TYPE: EPA:MFR

*****	*****	*****	*****
♦	♦	♦	♦
♦ PAIRED DATA ANALYSIS	♦ D D E	♦ L S	♦ SSSSS III T E
♦	♦ D D EEE	♦ L SSSSS	♦ I T EEE
♦ SUMMARY STATISTICS	♦ D D E	♦ L S	♦ I T E
♦	♦ DDDDD EEEEE	♦ LLLL SSSSS	♦ III T EEEEE
*****	*****	*****	*****

COMMENTS: SEPT ONLY, LAST ONLY

SIGNED DIFFERENCES: ( MFR - EPA )

- ALL FUELS -

\*\*\*\*\*

TP	SITE	HC			CO			CO2			NOX			MPG			COUNT BY MFR GROUP				
		NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	HON	CHR	FRD	GM	OTHR
FTP	D001	10	-0.040	0.055	10	-0.28	0.68	10	-2.50	6.96	10	-0.019	0.050	10	0.08	0.28	3	2	0	4	1
	D002	8	-0.057	0.043	8	-0.10	0.77	8	0.63	7.76	8	-0.019	0.075	8	-0.01	0.34	3	1	0	1	3
	D003	6	-0.017	0.011	6	0.08	0.32	6	-5.00	8.88	6	0.033	0.044	6	0.10	0.43	1	0	1	1	3
	D004	6	-0.020	0.052	6	-0.35	0.63	6	1.67	5.16	6	0.000	0.045	6	-0.05	0.21	1	0	2	1	2
	D005	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	D006	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	D007	1	-0.065	0.000	1	0.10	0.00	1	6.00	0.00	1	0.030	0.000	1	-0.30	0.00	0	0	0	0	1
	ALL	31	-0.037	0.046	31	-0.17	0.62	31	-1.10	7.34	31	-0.004	0.056	31	0.02	0.31	8	3	3	7	10
	A001	18	-0.048	0.049	18	-0.20	0.70	18	-1.11	7.28	18	-0.019	0.060	18	0.04	0.30	6	3	0	5	4
	A002	12	-0.019	0.036	12	-0.14	0.53	12	-1.67	7.75	12	0.017	0.046	12	0.02	0.33	2	0	3	2	5
	A003	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	A004	1	-0.065	0.000	1	0.10	0.00	1	6.00	0.00	1	0.030	0.000	1	-0.30	0.00	0	0	0	0	1
	ALL	31	-0.037	0.046	31	-0.17	0.62	31	-1.10	7.34	31	-0.004	0.056	31	0.02	0.31	8	3	3	7	10
HWFE	D001	8	-0.015	0.016	8	-0.03	0.17	8	-4.13	4.02	8	-0.019	0.066	8	0.35	0.29	2	2	0	3	1
	D002	8	-0.047	0.093	8	-0.23	0.46	8	6.75	13.46	8	0.014	0.045	8	0.65	1.42	3	1	0	1	3
	D003	5	-0.013	0.017	5	-0.01	0.05	5	3.60	8.11	5	-0.010	0.079	5	-0.54	0.93	1	0	1	1	2
	D004	8	-0.016	0.020	8	-0.09	0.13	8	0.75	4.95	8	0.020	0.047	8	-0.16	0.37	2	0	2	1	3
	D005	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	D006	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	D007	1	-0.017	0.000	1	0.07	0.00	1	2.00	0.00	1	0.030	0.000	1	-0.20	0.00	0	0	0	0	1
	ALL	30	-0.024	0.050	30	-0.09	0.26	30	1.57	8.94	30	0.003	0.057	30	-0.22	0.90	8	3	3	6	10
	A001	16	-0.031	0.067	16	-0.13	0.35	16	1.31	11.12	16	-0.002	0.057	16	-0.15	1.12	5	3	0	4	4
	A002	13	-0.015	0.018	13	-0.06	0.11	13	1.85	6.19	13	0.008	0.060	13	-0.31	0.64	3	0	3	2	5
	A003	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	A004	1	-0.017	0.000	1	0.07	0.00	1	2.00	0.00	1	0.030	0.000	1	-0.20	0.00	0	0	0	0	1
	ALL	30	-0.024	0.050	30	-0.09	0.26	30	1.57	8.94	30	0.003	0.057	30	-0.22	0.90	8	3	3	6	10

**Appendix 6-b**

PROCESSED: 10:38:05 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PATR TYPE: EPA:MFR

\*\*\*\*\*  
• PAIRED DATA ANALYSIS •  
• SUMMARY STATISTICS •  
\*\*\*\*\*

• PPPP CCCC TTTT SSSSS IIII EEEE  
• P P C T S SSSSS IIII EEEE  
• PPPP C T S SSSSS IIII EEEE  
• P CCCC T SSSSS IIII EEEE

COMMENTS: SEPT ONLY, LAST ONLY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- ALL FUELS -

TP	SITE	HC			CO			CO2			NOX			MPG			COUNT BY MFR GROUP				
		NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	HON	CHR	FRD	GM	OTH
FTP	D001	10	-16.6	20.6	10	-11.5	37.2	10	-0.37	1.51	10	-6.1	14.4	10	0.56	1.44	3	2	0	4	1
	D002	8	-21.4	14.9	8	6.0	63.8	8	0.11	1.75	8	-5.1	31.2	8	-0.08	1.68	3	1	0	1	3
	D003	6	-9.4	5.1	6	7.8	29.0	6	-0.98	2.02	6	18.6	30.4	6	0.49	2.10	1	0	1	1	3
	D004	6	-4.4	21.8	6	-6.7	16.6	6	0.30	0.94	6	6.2	26.1	6	-0.32	1.17	1	0	2	1	2
	D005	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0
	D006	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0
	D007	1	-21.5	0.0	1	7.5	0.0	1	1.29	0.00	1	3.4	0.0	1	-1.38	0.00	0	0	0	0	1
	ALL	31	-14.3	17.4	31	-1.7	40.3	31	-0.18	1.58	31	1.6	25.5	31	0.15	1.57	8	3	3	7	10
	A001	18	-18.8	18.0	18	-3.7	49.9	18	-0.16	1.59	18	-5.7	22.6	18	0.28	1.54	6	3	0	5	4
	A002	12	-6.9	15.3	12	0.6	23.8	12	-0.34	1.64	12	12.4	27.8	12	0.08	1.67	2	0	3	2	5
	A003	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0
	A004	1	-21.5	0.0	1	7.5	0.0	1	1.29	0.00	1	3.4	0.0	1	-1.38	0.00	0	0	0	0	1
	ALL	31	-14.3	17.4	31	-1.7	40.3	31	-0.18	1.58	31	1.6	25.5	31	0.15	1.57	8	3	3	7	10
HWFE	D001	8	-18.1	9.9	8	264.7	412.3	8	-1.20	1.06	8	-4.1	41.1	8	1.18	0.92	2	2	0	3	1
	D002	8	-25.7	30.0	8	-14.7	54.8	8	2.39	5.18	8	14.1	63.1	8	-2.06	4.22	3	1	0	1	3
	D003	5	-25.0	22.1	5	-2.2	63.9	5	1.41	2.98	5	30.4	74.4	5	-1.68	2.79	1	0	1	1	2
	D004	8	-23.3	23.2	8	-20.5	31.7	8	0.41	1.52	8	34.1	112.8	8	-0.49	1.24	2	0	2	1	3
	D005	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0
	D006	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0
	D007	1	-17.7	0.0	1	10.6	0.0	1	0.58	0.00	1	5.3	0.0	1	-0.68	0.00	0	0	0	0	1
	ALL	30	-22.6	21.1	30	61.2	241.2	30	0.68	3.23	30	17.0	73.8	30	-0.67	2.76	8	3	3	6	10
	A001	16	-21.9	21.9	16	125.0	318.6	16	0.59	4.06	16	5.0	52.3	16	-0.44	3.39	5	3	0	4	4
	A002	13	-23.9	21.8	13	-13.5	45.1	13	0.79	2.14	13	32.7	96.3	13	-0.95	1.97	3	0	3	2	5
	A003	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0
	A004	1	-17.7	0.0	1	10.6	0.0	1	0.58	0.00	1	5.3	0.0	1	-0.68	0.00	0	0	0	0	1
	ALL	30	-22.6	21.1	30	61.2	241.2	30	0.68	3.23	30	17.0	73.8	30	-0.67	2.76	8	3	3	6	10

## Appendix 7

PROCESSED: 10:38:04 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PAIR TYPE: EPA:MFR

*****	*****	*****
• PAIRED DATA ANALYSIS •	F FFFF T TTTT P PPPP	R R R F FFFF C
• SUMMARY STATISTICS •	F FFFF T T P PPPP	R R R R F C
•	F F T P	R R R R C C C
*****	*****	*****

COMMENTS: SEPT ONLY, LAST ONLY

PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %

- GASOLINE ONLY -

\*\*\*\*\*

### MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

RANDOM AUDIT			FAILURE AT MFR			FE UP BY 1 OR MORE			NEW VEHICLE			FE CORR OFFSET			ALL OTHERS			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYSL	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	3	0.38	1.82	0	0.00	0.00	0	0.00	0.00
30 FORD	2	-0.81	1.14	0	0.00	0.00	1	1.51	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
40 GM	2	-0.28	0.39	0	0.00	0.00	2	0.40	0.56	0	0.00	0.00	0	0.00	0.00	3	1.87	0.87
200 MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	-1.32	1.00	0	0.00	0.00	0	0.00	0.00
260 HONDA	1	4.04	0.00	0	0.00	0.00	3	-0.84	1.13	4	0.32	1.03	0	0.00	0.00	0	0.00	0.00
305 JCI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-0.77	0.00
347 LIPHT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-3.09	0.00	0	0.00	0.00	0	0.00	0.00
420 PRSH	1	1.58	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
603 WETLI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	0.36	1.50	0	0.00	0.00	0	0.00	0.00
640 AUDI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	0.25	1.79
ALL	6	0.58	1.99	0	0.00	0.00	6	-0.03	1.23	12	-0.22	1.56	0	0.00	0.00	6	0.89	1.50

PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %

- DIESEL ONLY -

200 MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-1.38	0.00	0	0.00	0.00	0	0.00	0.00
ALL	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-1.38	0.00	0	0.00	0.00	0	0.00	0.00

**Appendix 7-b**

PROCESSED: 10:38:24 OCT 30, 1991

PERIOD OF ANALYSIS: 9-1-91 TO 9-30-91

PAIR TYPE: EPA:MFR

	H	H	W	W	FFFFF	EEEEEE	RRRR	FFFFF	CCCC
PAIRED DATA ANALYSIS	H	H	W	W	F	E	R	R	C
SUMMARY STATISTICS	H	H	WW	WW	FFF	EEE	RRRR	FFFFF	C
	H	H	W	W	F	EEEEEE	R	R	C
	H	H	W	W	F	EEEEEE	R	R	CCCC

COMMENTS: SEPT ONLY, LAST ONLY

PERCENT DIFFERENCE:  $((MFR - EPA)/EPA) \times 100\%$

- GASOLINE ONLY -

RANDOM AUDIT			FAILURE AT MFR			FE UP BY 1 OR MORE			NEW VEHICLE			FE CORR OFFSET			ALL OTHERS			
NUM	AVG.	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYS	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	3	-0.29	2.44	0	0.00	0.00	0	0.00	0.00
30 FORD	2	-3.35	1.57	0	0.00	0.00	1	-0.32	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
40 GM	2	0.50	1.16	0	0.00	0.00	2	-0.29	0.06	0	0.00	0.00	0	0.00	0.00	2	0.47	0.22
200 MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	0.47	0.66	0	0.00	0.00	0	0.00	0.00
260 HONDA	1	1.87	0.00	0	0.00	0.00	3	0.50	1.54	4	0.15	1.05	0	0.00	0.00	0	0.00	0.00
305 JCI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-1.00	0.00
347 LIPHT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-12.13	0.00	0	0.00	0.00	0	0.00	0.00
420 PRSCH	1	0.30	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
603 WETLI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	0.99	2.07	0	0.00	0.00	0	0.00	0.00
640 AUDI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	-3.46	1.58
ALL	6	-0.59	2.38	0	0.00	0.00	6	0.10	1.07	12	-0.79	3.84	0	0.00	0.00	5	-1.39	2.13
PERCENT DIFFERENCE: $((MFR - EPA)/EPA) \times 100\%$																		
- DIESEL ONLY -																		
200 MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-0.68	0.00	0	0.00	0.00	0	0.00	0.00
ALL	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-0.68	0.00	0	0.00	0.00	0	0.00	0.00



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ANN ARBOR, MICHIGAN 48105

October 1, 1991

A.91-46

IV-B-2

OFFICE OF  
AIR AND RADIATIONMEMORANDUM

SUBJECT: Paired Data Report - August 1991.

FROM: Robert Gilkey *Robert Gilkey*  
 Correlation and Engineering Services

TO: Eldert Bontekoe, Team Leader  
 Certification Branch

THRU: Martin Reineman, Manager *MR*  
 Correlation and Engineering Services

Attached is the paired data report for August 1991. The findings of this analysis are as follows:

1. Both the FTP and HFET overall fuel economy percent differences as well as overall FTP emission percent differences are acceptable.
2. Chrysler's FTP fuel economy running average remains high due to previous months' offsets. Their single FTP test in August had a +1.8% offset.

If you have additional questions on this report, please contact me at X397.

## Attachments

cc: T. Ball  
 R. Montgomery  
 R. Lawrence  
 J.D. Carpenter  
 J.T. White  
 B. Kolowich  
 D. Danyko  
 T. Schrodts  
 D. Perkins  
 M. Caldwell

0248g

Technical Report

Paired Data Report August 1991

Robert Gilkey  
September 30, 1991

Program Development & Quality Staff  
U.S. Environmental Protection Agency  
2565 Plymouth Road  
Ann Arbor, MI 48105

This report presents the paired data for August 1991.

The data are summarized in the following attachments:

Attachment A	Monthly Paired Data Status Graphs.
Attachment B	Manufacturer Paired Data Status Graphs.
Attachment C	Data Presentation Methodology.
Appendix 1	Testing Summary.
Appendix 2	Absolute Differences and Percent Differences for the FTP.
Appendix 3	Absolute Differences and Percent Differences for the HFET.
Appendix 4	Evaporative Emission Data.
Appendix 5	Roadload Data.
Appendix 6	Absolute Differences and Percent Differences by Site.
Appendix 7	FTP MPG and HFET MPG Percent Differences by Reason for Confirmation.

Attachment A displays monthly means and three month running averages of data from the three months ending July 1991. Attachment B contains monthly means and three month running averages of FTP and HFET fuel economy percent differences for Chrysler, Ford, GM and the combined averages of other manufacturers. Attachment C presents the data stratification used and screening limits applied to data for presentation in the other attachments. The Appendices present the paired data summary statistics.

Conclusions:

1. Both the FTP and HFET overall fuel economy percent differences as well as overall FTP emission percent differences are acceptable.
2. Chrysler's FTP fuel economy running average remains high due to previous months' offsets. Their single FTP test in August had a +1.8% offset.

Discussion:

Statistical Observations:

Table 1 lists manufacturers' offsets which exceeded the levels listed in Attachment C and showed a statistically significant difference from EPA.

-2-

Table I  
Three Months Ending August 1991  
Percent Differences\* of Manufacturers

<u>Manufacturer</u>	<u>FTP</u>	<u>HFET</u>							
	<u>NUM</u>	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>	<u>NUM</u>	<u>MPG</u>	<u>NUM</u>	<u>CDT</u>
Chrysler	12				+2.0				
Saab						15	+2.0		

\* Percent difference = ((MFR-EPA)/EPA) x 100

The single Chrysler FTP pair this month gave a difference of +1.8%. The vehicle was tested at CPG in Chelsea. A review of this offset results shows:

- A special EPA/JTE correlation program completed last month revealed no significant fuel economy differences between the laboratories.

- The quarterly MVMA correlation program data showed higher, but acceptable, FTP and HFET fuel economy at both the CPG and JTE laboratories ranging from 0.7% to 1.5%. Chrysler will finish the program with retests at JTE late this month.

Saab did not test any vehicles this month. No reason for the offset was apparent during investigation of the offset last month.

#### Combined Manufacturer's Results:

Attachment A shows acceptable overall FTP emission running averages.

Both the FTP and HFET MPG running averages remain near zero and are acceptable.

#### Selected Manufacturers Results:

Attachment B shows acceptable fuel economy and coastdown differences with the manufacturers. The high three month running average for the Chrysler FTP fuel economy is a consequence of the very small numbers of Chrysler tests in July and August (2 and 1 respectively) relative to June with 9 tests. The single FTP and HFET tests in August are insufficient for their fuel economy excursions to be meaningful.

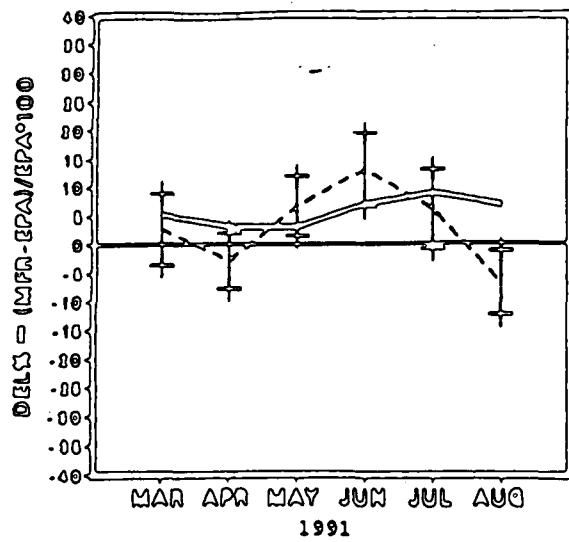
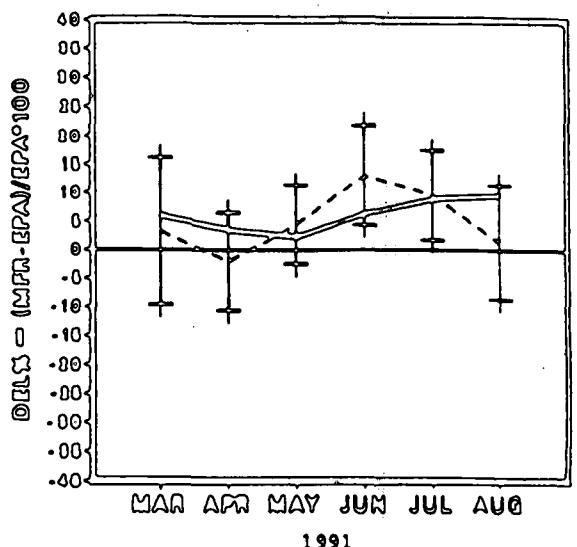
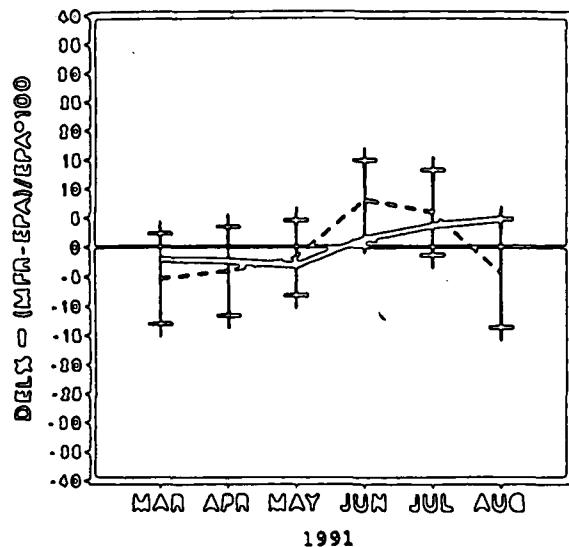
#### Paired Data Summary Statistics:

No vehicles were excluded from the summary statistics for exceeding the screening limits in Appendix C.

If you have any further questions, call me on ext. 397.

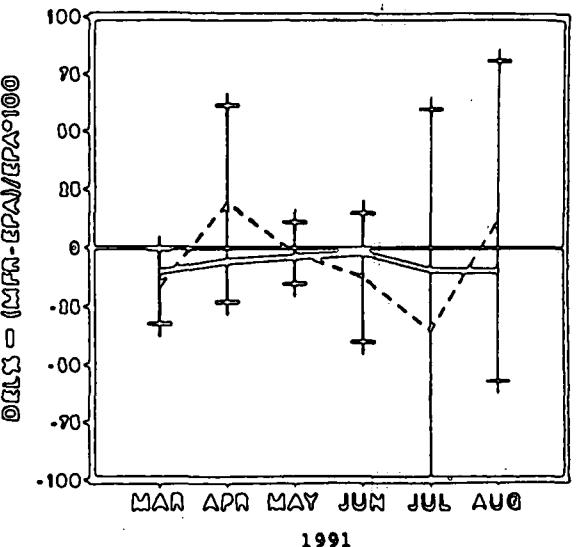
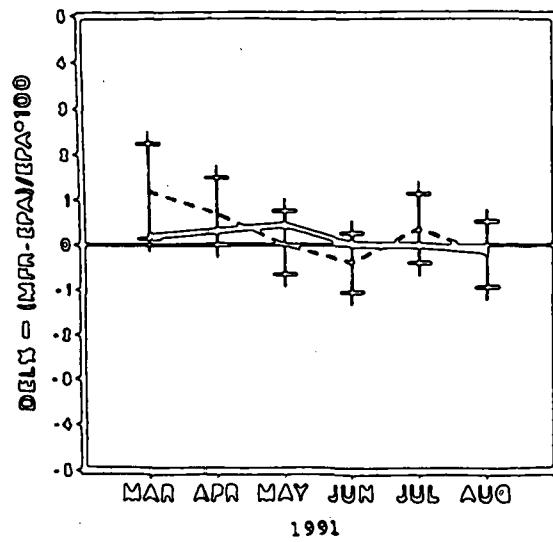
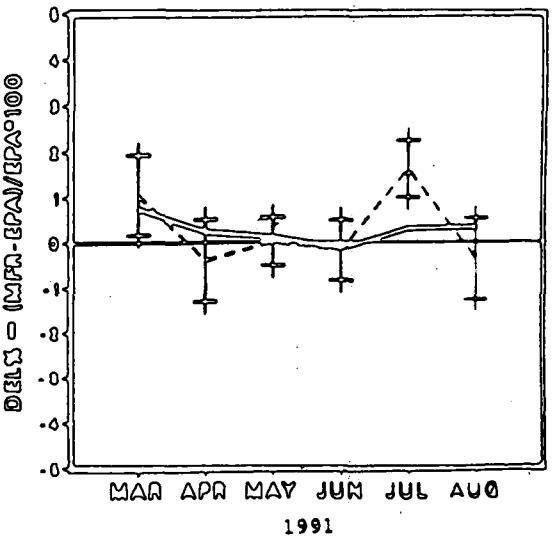
#### Attachments

**ATTACHMENT A**  
**Engineering Operations Division**  
**Monthly Patrol Data Status Graphs**

**FTP HC****FTP CO****FTP NOX****EVAPORATIVE EMISSIONS**

Legend

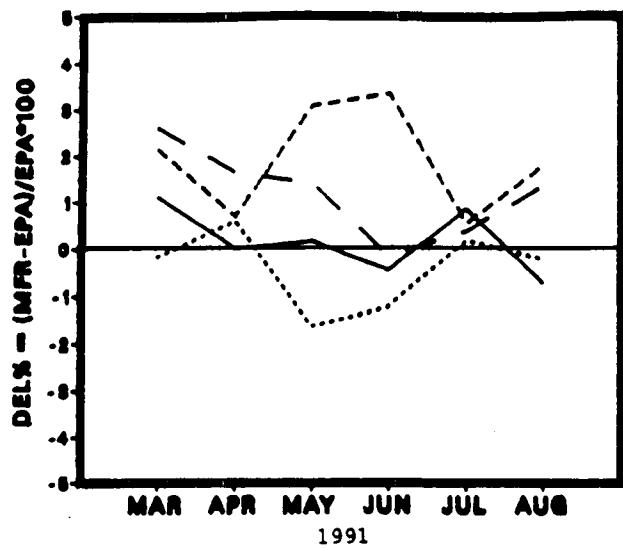
- MTPA - (MTPA-EPA)/EPA\*100
- MTPA - (MTPA-EPA)/EPA\*100
- + ----- ODS Control Interval

**FTP MPG****HPET MPG**

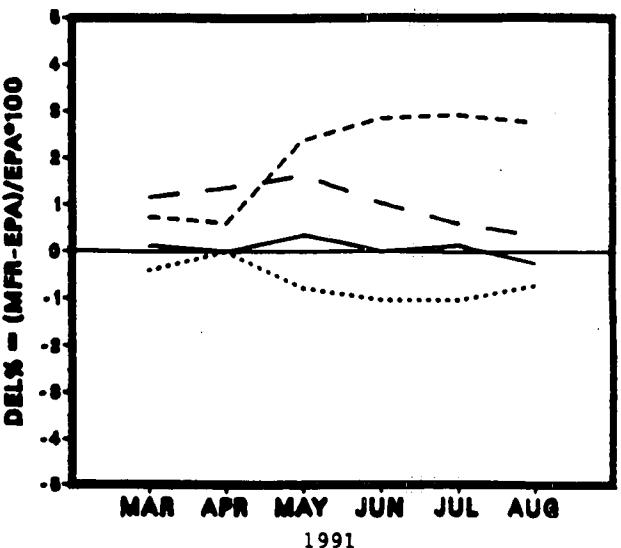
## ATTACHMENT B

**Engineering Operations Division**  
**Manufacturer Paired Data Status Graphs**

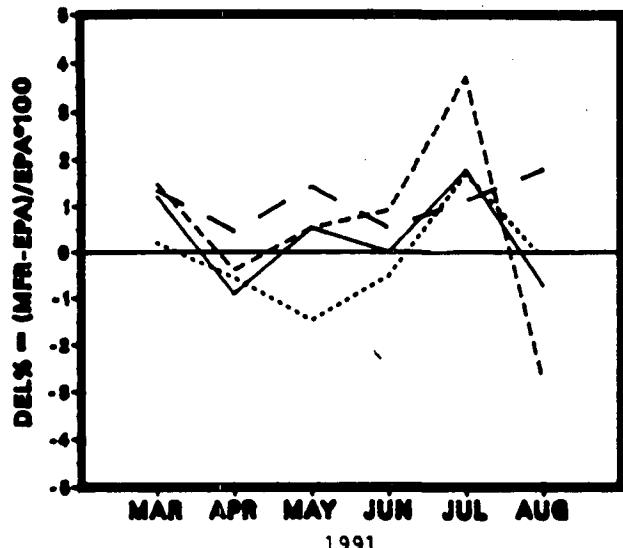
**FTP MPG  
MONTHLY MEANS**



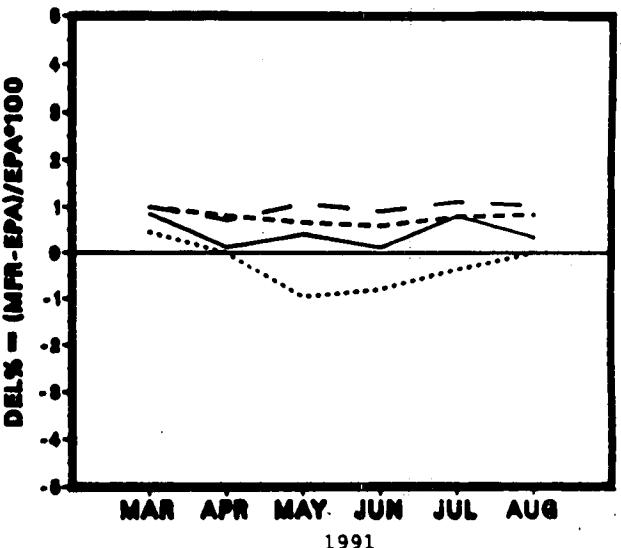
**FTP MPG  
THREE MONTH RUNNING AVERAGE**



**HFET MPG  
MONTHLY MEANS**

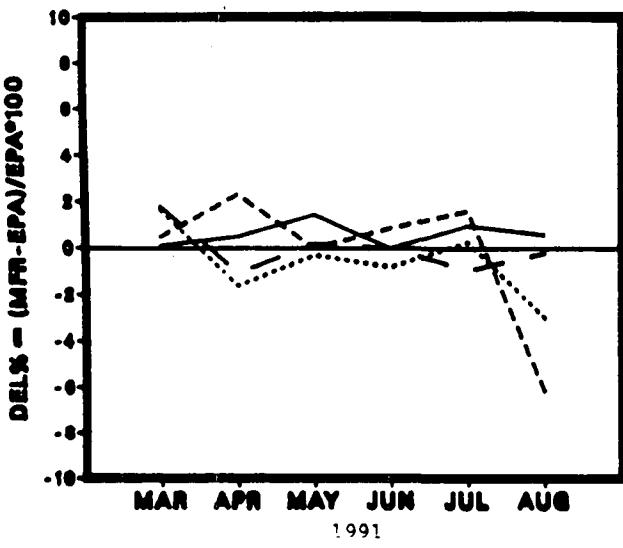


**HFET MPG  
THREE MONTH RUNNING AVERAGE**

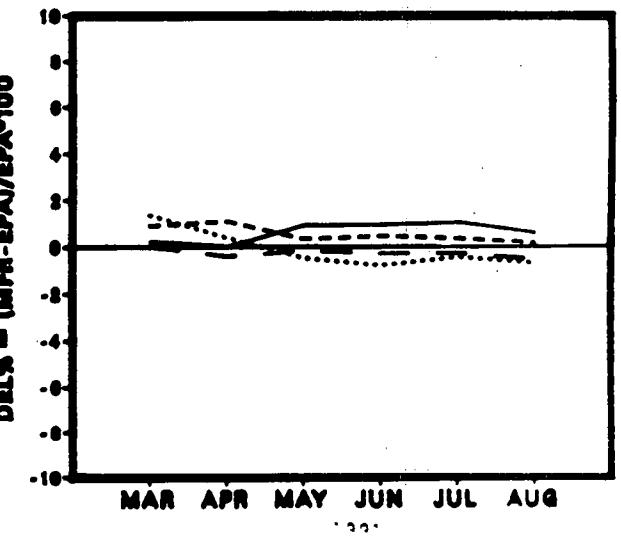
**Legend**

- GM
- FORD
- CHRYSLER
- OTHERS...

**QUICKCHECK COASTDOWN  
MONTHLY MEANS**



**QUICKCHECK COASTDOWN  
THREE MONTH RUNNING AVERAGE**



ATTACHMENT CEngineering Operations Division  
Data Presentation Methodology

## Table Preparation:

Table 1 is developed using a paired t-test at the 95% confidence level. The paired t-test is based on analysis of the last test pairs with no paired data screens. All confirmation code strata are used for emission analysis, while fuel economy analysis excludes the "UP BY 1 OR MORE" reason for confirmation stratum. The table lists those tests which differ from EPA at the 95% confidence level and exceed the limits below.

HC	-10%
CO	-10%
NOx	-10%
FTP Fuel Economy	+1.5%
HFET Fuel Economy	+1.5%
Quickcheck Coastdown Time	+2.0%

## Graph Preparation:

Attachment A emission status graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE up by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

-2-

**Summary Statistics Preparation:**

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

Paired Data Rejection Criteria

	<u>FTP</u>				
	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg
Upper	0.75	6.0	65.0	0.75	3.2
Lower	-0.75	-6.0	-65.0	-0.75	-3.2

FTP (% Difference)

Upper	135.0	160.0	15.0	100.0	15.0	*
Lower	-99.0	-99.0	-15.0	-99.0	-15.0	*

HFET

	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg	CDT sec
Upper	0.2	6.0	45.0	1.0	4.5	
Lower	-0.2	-6.0	-45.0	-1.0	-4.5	

HFET (% Difference)

Upper		15.0	15%
Lower		-15.0	-15%

\* Values to be set in revised paired data program currently under development.

## Appendix 1

PROCESSED: 08:54:30 SEP 12, 1991

CCID: SNBZ

PROJECT: 7030

NAME: RKG

	*	TTTTT	EEEEEE	SSSSS	TTTTT	SSSSS	U	U	M	M	SSSSS
* PAIRED DATA ANALYSIS	*	T	E	S	T	S	U	U	MM	MM	S
* SUMMARY STATISTICS	*	T	EEE	SSSSS	T	SSSSS	U	U	M	M	SSSSS
	*	T	E	S	T	S	U	U	M	M	S
	*	T	EEEEEE	SSSSS	T	SSSSS	UUU	M	M	SSSSS	

PERIOD OF ANALYSIS: 8- 1-91 TO 8-31-91

TEST TYPE(S): EMISSION DATA

FUEL ECONOMY

PAIR TYPE: EPA:MFR

ANALYZER(S): ALL

MODEL YEAR(S): ALL

DYNAMOMETER(S): ALL

FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL EVAP CLASS: EVAP AND NON EVAP

VEHICLE ADJUSTMENT: ALL VEHICLES HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

COMMENTS:

	FTP		HWFE	
	GAS	DIESEL	GAS	DIESEL
	*****	*****	*****	*****
A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS	31	1	29	1
B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS	0	0	0	0
C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA	5	0	4	0
D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE	8	0	7	0
E. NUMBER OF VOID EPA TESTS	2	0	1	0
 TOTAL NUMBER OF EPA TESTS IN THIS PERIOD	 46	 1	 41	 1
PAIRS MADE = (A+B+C)	36	1	33	1
POSSIBLE PAIRS = (A+B+C+D)	44	1	40	1
PERCENT PAIRED: ((A+B+C)/PPAIRS)*100%	81.8	100.0	82.5	100.0
PERCENT NOT PAIRED: (D/PPAIRS)*100%	18.2	0.0	17.5	0.0
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

## Appendix 2

PROCESSED: 08:54:31 SEP 12, 1991

PERIOD OF ANALYSIS: 8- 1-91 TO 8-31-91

PAIR TYPE: EPA:MFR

*	FFFFF	TTTTT	PPPPP	DDDD	EEEEEE	L
*	F	T	P P	D D	E	L
*	FFF	T	PPPPP	O O	EEE	L
*	F	T	P	D D	E	L
*	F	T	P	DDDD	EEEEEE	LLLLL

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA)

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	1	-0.005	0.000	1	0.33	0.00	1	-5.7	0.0	1	-0.165	0.000	1	0.40	0.00
30 FORD	5	-0.014	0.022	5	-0.20	0.44	5	-5.4	4.1	5	-0.020	0.041	5	0.37	0.28
40 GM	18	-0.024	0.025	18	-0.04	0.38	18	4.7	7.1	18	-0.021	0.062	18	-0.16	0.41
196 DSM	1	-0.018	0.000	1	0.56	0.00	1	7.0	0.0	1	0.034	0.000	1	-0.36	0.00
251 GKAUT	1	-0.031	0.000	1	-0.11	0.00	1	2.0	0.0	1	-0.017	0.000	1	-0.29	0.00
420 PRSCH	2	0.040	0.029	2	0.09	0.13	2	-1.0	9.1	2	0.029	0.101	2	0.08	0.30
590 V W	1	0.128	0.000	1	1.18	0.00	1	-8.3	0.0	1	0.097	0.000	1	0.47	0.00
600 VOLVO	2	-0.024	0.028	2	-0.20	0.21	2	0.5	4.7	2	-0.005	0.017	2	-0.23	0.30
ALL	31	-0.013	0.038	31	0.00	0.42	31	1.6	7.4	31	-0.016	0.064	31	-0.04	0.42

SIGNED DIFFERENCES: (MFR - EPA)

- DIESEL ONLY -

													PARTIC		
	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
590 V W	1	-0.017	0.000	1	-0.09	0.00	1	-6.8	0.0	1	0.101	0.000	1	0.83	0.00
ALL	1	-0.017	0.000	1	-0.09	0.00	1	-6.8	0.0	1	0.101	0.000	1	0.83	0.00
	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
	1	-0.010	0.000	1	-0.010	0.000	1	-0.010	0.000	1	-0.010	0.000	1	-0.010	0.000

## Appendix 2-b

PROCESSED: 08:54:31 SEP 12, 1991

PERIOD OF ANALYSIS: 8- 1-91 TO 8-31-91

PAIR TYPE: EPA:MFR

	*****	FFFFF	TTTTT	PPPP	PPPP	CCCC	TTTTT
	*	F	T	P	P	P	C
	*	FFF	T	PPP	PPP	C	T
	*	SUMMARY STATISTICS	*	F	T	P	P
	*	*	F	T	P	P	CCCC
	*****	*****	*****	*****	*****	*****	*****

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

\*\*\*\*\*

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV												
20 CHRYS	1	-4.3	0.0	1	12.4	0.0	1	-1.45	0.00	1	-33.3	0.0	1	1.79	0.00
30 FORD	5	-9.0	12.4	5	-12.1	22.6	5	-1.41	1.05	5	-2.0	16.0	5	1.60	1.18
40 GM	18	-10.9	11.1	18	-2.1	22.8	18	1.15	1.70	18	-11.1	17.0	18	-0.68	1.74
196 DSM	1	-10.5	0.0	1	51.9	0.0	1	1.89	0.00	1	25.0	0.0	1	-1.51	0.00
251 GKAUT	1	-10.3	0.0	1	-4.9	0.0	1	0.48	0.00	1	-7.2	0.0	1	-1.38	0.00
420 PRSCH	2	20.5	14.3	2	7.3	10.3	2	-0.21	1.87	2	32.3	82.9	2	0.43	1.62
590 V W	1	37.3	0.0	1	88.1	0.0	1	-1.73	0.00	1	22.9	0.0	1	2.55	0.00
600 VOLVO	2	-13.0	14.1	2	-10.9	8.5	2	0.11	1.20	2	-0.1	7.6	2	-1.05	1.36
ALL	31	-6.9	15.3	31	1.3	27.5	31	0.41	1.79	31	-4.5	25.1	31	-0.13	1.81

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- DIESEL ONLY -

\*\*\*\*\*

	PARTIC														
	NUM	AVG	STDEV	NUM	AVG	STDEV									
590 V W	1	-8.1	0.0	1	-9.5	0.0	1	14.7	0.0	1	2.47	0.00	1	-17.9	0.0
ALL	1	-8.1	0.0	1	-9.5	0.0	1	-2.26	0.00	1	14.7	0.0	1	2.47	0.00
	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****

### Appendix 3

PROCESSED: 08:54:33 SEP 12, 1991

PERIOD OF ANALYSIS: 8- 1-91 TO 8-31-91

PAIR TYPE: EPA:MFR

```
***** * H H W W FFFFF EEEEE DDDD EEEEE L
* PAIRED DATA ANALYSIS * H H W W F E D D E L
* HHHHH W W W FFF EEE D D EEE L
* SUMMARY STATISTICS * H H WW WW F E D D E L
* H H W W F EEEEE DDDD EEEEE LLLL
```

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA)

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	1	0.003	0.000	1	0.24	0.00	1	6.9	0.0	1	-0.043	0.000	1	-0.98	0.00
30 FORD	3	-0.003	0.003	3	0.11	0.23	3	-4.9	1.4	3	0.026	0.035	3	0.59	0.21
40 GM	18	-0.002	0.007	18	0.02	0.12	18	2.7	6.3	18	-0.039	0.054	18	-0.22	0.69
196 DSM	1	-0.031	0.000	1	0.05	0.00	1	5.6	0.0	1	0.020	0.000	1	-0.62	0.00
251 GKAUT	1	0.038	0.000	1	0.31	0.00	1	1.1	0.0	1	-0.015	0.000	1	-0.41	0.00
420 PRSCH	2	-0.010	0.001	2	-0.04	0.06	2	5.0	3.8	2	-0.015	0.018	2	-0.39	0.49
590 V W	1	-0.013	0.000	1	0.11	0.00	1	-16.6	0.0	1	0.023	0.000	1	1.58	0.00
600 VOLVO	2	0.007	0.021	2	0.00	0.12	2	-0.5	1.2	2	0.102	0.163	2	-0.25	0.05
ALL	29	-0.002	0.012	29	0.05	0.14	29	1.4	6.7	29	-0.016	0.067	29	-0.13	0.71

SIGNED DIFFERENCES: (MFR - EPA)

- DIESEL ONLY -

590 V W	1	0.079	0.000	1	-0.09	0.00	1	7.3	0.0	1	0.192	0.000	1	-1.46	0.00
ALL	1	0.079	0.000	1	-0.09	0.00	1	7.3	0.0	1	0.192	0.000	1	-1.46	0.00

## Appendix 3-b

PROCESSED: 08:54:33 SEP 12, 1991  
 PERIOD OF ANALYSIS: 8- 1-91 TO 8-31-91  
 PAIR TYPE: EPA:MFR

```
*****  

*          * H H W W FFFFF EEEEE PPPP CCCC TTTT  

* PAIRED DATA ANALYSIS * H H W W FFFF EEE PPPP C C T  

*          * H H WW WW F E P C T  

* SUMMARY STATISTICS * H H W W F EEEEE P CCCC T  

*****
```

### COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV												
20 CHRYS	1	17.6	0.0	1	66.7	0.0	1	2.75	0.00	1	-26.4	0.0	1	-2.77	0.00
30 FORD	3	-13.8	16.6	3	0.3	65.2	3	-1.81	0.56	3	17.0	31.3	3	1.79	0.63
40 GM	18	-2.2	29.7	18	69.8	158.4	18	1.04	2.23	18	-15.1	30.0	18	-0.65	2.13
196 DSM	1	-33.7	0.0	1	41.7	0.0	1	2.31	0.00	1	100.0	0.0	1	-1.69	0.00
251 GKAUT	1	61.3	0.0	1	129.2	0.0	1	0.35	0.00	1	-12.0	0.0	1	-1.46	0.00
420 PRSCH	2	-36.2	0.7	2	-13.2	18.7	2	1.79	1.37	2	-15.5	18.5	2	-1.24	1.53
590 V W	1	-37.1	0.0	1	24.4	0.0	1	-4.78	0.00	1	18.1	0.0	1	6.19	0.00
600 VOLVO	2	4.8	87.5	2	50.0	183.8	2	-0.17	0.46	2	11.5	96.2	2	-0.74	0.14
ALL	29	-4.7	34.1	29	54.9	133.4	29	0.59	2.31	29	-5.1	39.2	29	-0.34	2.31

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- DIESEL ONLY -

	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV			
590 V W	1	125.4	0.0	1	-16.4	0.0	1	3.37	0.00	1	50.8	0.0	1	-3.13	0.00
ALL	1	125.4	0.0	1	-16.4	0.0	1	3.37	0.00	1	50.8	0.0	1	-3.13	0.00

## Appendix 4

PROCESSED: 08:54:32 SEP 12, 1991

PERIOD OF ANALYSIS: 8-1-91 TO 8-31-91

PAIR TYPE: EPA:MFR

	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
	*	E	V	V	AAA	PPP	DDD	AAA	TTT	AAA		
	*	E	V	V	A A	P P	D D	A A	T	A A		
	*	EEE	V	V	AAAAA	PPP	D D	AAAAA	T	AAAAA		
	*	E	V	V	A A	P	D D	A A	T	A A		
	*	EEEEEE	V	A A	P	DDDD	A A	T	A A			

COMMENTS:

DATA AND DIFFERENCES:

	EPA GM/TEST			(M-E) DIURNAL			(M-E) H. SOAK			(M-E) TOTAL			(M-E)/E % DIFF			EPA SOAK		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
30 FORD	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
40 GM	5	0.69	0.42	5	0.25	0.39	5	0.12	0.16	5	0.38	0.49	5	67.5	94.4	5	17.4	1.1
196 DSM	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
251 GKAUT	1	0.74	0.00	1	-0.25	0.00	1	-0.20	0.00	1	-0.45	0.00	1	-60.8	0.0	1	18.0	0.0
420 PRSCH	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
590 V W	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
600 VOLVO	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
ALL	6	0.70	0.38	6	0.17	0.41	6	0.07	0.20	6	0.24	0.55	6	46.1	99.4	6	17.5	1.0
BY SHED: (EPA TESTS)																		
S001	2	0.93	0.71	2	-0.06	0.04	2	0.13	0.18	2	0.07	0.14	2	2.5	13.3	2	17.5	0.7
S002	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
S003	4	0.58	0.12	4	0.28	0.47	4	0.04	0.22	4	0.32	0.69	4	67.9	120.4	4	17.5	1.3
S004	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
ALL	6	0.70	0.38	6	0.17	0.41	6	0.07	0.20	6	0.24	0.55	6	46.1	99.4	6	17.5	1.0

## Appendix 5

PROCESSED: 08:54:34 SEP 12, 1991

PERIOD OF ANALYSIS: 8- 1-91 TO 8-31-91

PAIR TYPE: EPA:MFR

*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
RRRR	000	AAA	DDDD	L	000	AAA	DDDD							
R R	0 0	A A	D D	L	0 0	A A	D D							
RRRR	0 0	AAAAA	D D	L	0 0	AAAAA	D D							
R R	0 0	A A	D D	L	0 0	A A	D D							
R R	000	A A	DDDD	LLLLL	000	A A	DDDD							
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****

COMMENTS:

COASTDOWN DATA:

\*\*\*\*\*

	MFR TRK			MFR QCHK			EPA QCHK			(MFR-EPA)			((M-E)/E)%		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	1	15.11	0.00	1	14.26	0.00	1	15.19	0.00	1	-0.93	0.00	1	-6.12	0.00
30 FORD	3	16.60	1.63	3	16.81	2.39	3	16.84	2.35	3	-0.03	0.18	3	-0.21	1.14
40 GM	18	16.85	0.89	18	17.25	0.86	18	17.15	0.83	18	0.10	0.34	18	0.59	1.99
196 DSM	1	14.46	0.00	1	15.24	0.00	1	15.40	0.00	1	-0.16	0.00	1	-1.04	0.00
251 GKAUT	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00
420 PRSCH	2	15.38	0.36	2	15.19	0.66	2	16.09	0.77	2	-0.90	0.11	2	-5.61	0.39
590 V W	1	16.48	0.00	1	16.93	0.00	1	16.81	0.00	1	0.12	0.00	1	0.71	0.00
600 VOLVO	2	14.70	0.02	2	14.73	0.02	2	15.21	0.24	2	-0.48	0.24	2	-3.14	1.53
ALL	29	15.84	3.25	29	16.11	3.38	29	16.18	3.31	29	-0.07	0.43	29	-0.48	2.63

COASTDOWN DATA:

\*\*\*\*\*

	MFR TRK			MFR QCHK			EPA QCHK			(MFR-EPA)			((M-E)/E)%		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
590 V W	1	17.08	0.00	1	16.27	0.00	1	16.23	0.00	1	0.04	0.00	1	0.25	0.00
ALL	1	17.08	0.00	1	16.27	0.00	1	16.23	0.00	1	0.04	0.00	1	0.25	0.00

## Appendix 6

SIGNED DIFFERENCES: ( MFR - EPA )										- ALL FUELS -										MPG																																																																																																																																																																																										
TP SITE					HC					CO					CO2					NOX																																																																																																																																																																																										
FTP	TP	SITE	NUM	Avg	STDEV	HC	TP	SITE	NUM	Avg	STDEV	CO	TP	SITE	NUM	Avg	STDEV	CO2	TP	SITE	NUM	Avg	STDEV	NOX	TP	SITE	NUM	Avg	STDEV	AMC	CHR	FRD	GM	OTHR																																																																																																																																																																												
D001	9	-0.025	0.026	9	-0.07	0.26	D002	7	0.006	0.031	7	-0.02	0.30	D003	11	-0.008	0.049	11	-0.25	0.48	D004	4	-0.035	0.020	4	-0.48	0.35	D005	0	0.000	0.000	0	0.00	0.00	D006	0	0.000	0.000	0	0.00	0.00	D007	1	-0.017	0.000	1	-0.09	0.00	ALL	32	-0.013	0.037	32	-0.00	0.42	A001	16	-0.011	0.032	16	-0.05	0.27	A002	15	-0.015	0.044	15	0.05	0.55	A003	0	0.000	0.000	0	0.00	0.00	A004	1	-0.017	0.000	1	-0.09	0.00	ALL	32	-0.013	0.037	32	-0.00	0.42	HwFE	11	0.005	0.014	11	0.11	0.18	D001	5	-0.006	0.005	5	-0.03	0.05	D003	7	-0.006	0.007	7	0.03	0.06	D004	6	-0.006	0.013	6	0.03	0.11	D005	0	0.000	0.000	0	0.00	0.00	D006	0	0.000	0.000	0	0.00	0.00	D007	1	0.079	0.000	1	-0.09	0.00	ALL	30	0.001	0.019	30	0.04	0.14	A001	16	0.001	0.013	16	0.06	0.17	A002	13	-0.006	0.010	13	0.03	0.08	A003	0	0.000	0.000	0	0.00	0.00	A004	1	0.079	0.000	1	-0.09	0.00	ALL	30	0.001	0.019	30	0.04	0.14	TP	SITE	NUM	Avg	STDEV	TP	SITE	NUM	Avg	STDEV	TP	SITE	NUM	Avg	STDEV	TP	SITE	NUM	Avg	STDEV	AMC	CHR	FRD	GM	OTHR
PROCESSED: 08:54:32 SEP 12, 1991							PAIRED DATA ANALYSIS						D001	D	D	E	D	D	E	D	D	E	L	SSSS	I	III	TTT	EEEE																																																																																																																																																																																		
PERIOD OF ANALYSIS: 8- 1-91 TO 8-31-91							SUMMARY STATISTICS						D002	D	D	E	D	D	E	D	D	E	L	SSSS	I	III	TTT	EEEE																																																																																																																																																																																		
PAIR TYPE: EPA:MF													D003	D	D	E	D	D	E	D	D	E	L	SSSS	I	III	TTT	EEEE																																																																																																																																																																																		

COMMENTS:

## Appendix 6-b

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%										- ALL FUELS -										
TP SITE					HC					CO					CO <sub>2</sub>					
***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	
F	T	P	D	O	N	M	A	V	E	N	M	A	V	S	N	A	V	S	G	
PROCESSSED:	08:54:32	SEP 12, 1991	PAIRED DATA ANALYSIS	*	PPPP	P	CCCC	TTTT	S	SSSS	III	TTTTT	T	EEEE	AMC	CHR	FRD	GM	OTHR	
PERIOD OF ANALYSIS:	8-1-91	TO 8-31-91	SUMMARY STATISTICS	*	PPPP	P	CCCC	T	S	SSSS	I	T	T	EEE	AMC	CHR	FRD	GM	OTHR	
PAIR TYPE: EPA:MFR				*	P	CCCC	T	SSSS	S	III	III	T	T	EEEE	AMC	CHR	FRD	GM	OTHR	
COMMENTS:																				
ALL	32	-6.9	15.0	32	1.0	27.2	32	0.33	1.82	32	-3.9	24.9	32	-0.05	1.84	0	1	5	18	
A001	16	-4.6	14.4	16	-2.6	17.6	16	0.82	1.51	16	0.2	27.2	16	-0.69	1.43	0	0	2	9	
A002	15	-9.4	16.2	15	5.5	35.5	15	-0.02	2.01	15	-9.5	22.6	15	0.46	2.03	0	1	3	9	
A003	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	
A004	1	-8.1	0.0	1	-9.5	0.0	1	-2.26	0.00	1	14.7	0.0	1	2.47	0.00	0	0	0	1	
HWFE	ALL	32	-6.9	15.0	32	1.0	27.2	32	0.33	1.82	32	-3.9	24.9	32	-0.05	1.84	0	1	5	18
D001	11	18.3	40.9	11	105.1	160.6	11	0.57	2.98	11	-15.0	21.7	11	-0.49	2.77	0	0	2	7	
D002	5	-30.5	21.0	5	-19.1	36.8	5	1.45	1.10	5	20.0	48.0	5	-1.20	0.94	0	0	2	3	
D003	7	-15.3	13.0	7	70.0	161.6	7	-0.32	2.40	7	-29.2	30.5	7	0.81	2.73	0	0	6	1	
D004	6	-13.0	22.7	6	7.1	38.8	6	0.98	1.44	6	20.1	47.6	6	-0.71	1.42	0	1	3	1	
D005	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	
D006	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	
D007	1	125.4	0.0	1	-16.4	0.0	1	3.37	0.00	1	50.8	0.0	1	-3.13	0.00	0	0	0	1	
ALL	30	-0.4	41.0	30	52.6	131.7	30	0.68	2.32	30	-3.3	39.8	30	-0.44	2.32	0	1	3	18	
A001	16	3.1	42.2	16	66.3	145.2	16	0.85	2.53	16	-4.1	34.8	16	-0.71	2.34	0	0	2	9	
A002	13	-14.3	17.3	13	41.0	121.5	13	0.28	2.05	13	-6.5	45.5	13	0.11	2.28	0	1	1	9	
A003	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	
A004	1	125.4	0.0	1	-16.4	0.0	1	3.37	0.00	1	50.8	0.0	1	-3.13	0.00	0	0	0	1	
ALL	30	-0.4	41.0	30	52.6	131.7	30	0.68	2.32	30	-3.3	39.8	30	-0.44	2.32	0	1	3	18	

## Appendix 7

PROCESSED: 08:54:32 SEP 12, 1991

PERIOD OF ANALYSIS: 8-1-91 TO 8-31-91

PAIR TYPE: EPA:MFR

*****	*****	*****				
*	FFFFF	TTTTT	PPPP	RRRR	FFFFF	CCCC
* PAIRED DATA ANALYSIS	F	T	P P	R R	F	C
*	FFFF	T	PPPP	RRRR	FFFF	C
* SUMMARY STATISTICS	F	T	P	R R	R	C
*	F	T	P	R R	R	CCCC
*****	*****	*****				

COMMENTS:

PERCENT DIFFERENCE:  $((MFR - EPA)/EPA) \times 100\%$  - GASOLINE ONLY -

\*\*\*\*\*

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE																		
RANDOM AUDIT			FAILURE AT MFR			FE UP BY 1 OR MORE			NEW VEHICLE			FE CORR OFFSET			ALL OTHERS			
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYS	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	1.79	0.00			
30 FORD	1	1.95	0.00	0	0.00	0.00	1	2.59	0.00	0	0.00	0.00	0	1.15	1.39			
40 GM	4	1.10	1.58	0	0.00	0.00	2	-0.62	1.17	0	0.00	0.00	0	0.00	0.00	12	-1.29	1.52
196 DSM	1	-1.51	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
251 GKAUT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-1.38	0.00	0	0.00	0.00	0	0.00	0.00
420 PRSCH	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	0.43	1.62
590 V W	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	2.55	0.00
600 VOLVO	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	-1.05	1.36	0	0.00	0.00	0	0.00	0.00
ALL	6	0.81	1.70	0	0.00	0.00	3	0.45	2.03	3	-1.16	0.98	0	0.00	0.00	19	-0.36	1.88
PERCENT DIFFERENCE:	$((MFR - EPA)/EPA) \times 100\%$ - DIESEL ONLY -																	
*****	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
590 V W	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	2.47	0.00
ALL	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	2.47	0.00

PROCESSED: 08:54:34 SEP 12, 1991

PERIOD OF ANALYSIS: 8-1-91 TO 8-31-91

PAIR TYPE: EPA:MFR

	*	H	H	W	W	FFFFF	EEEEEE	RRRR	FFFFF	CCCC		
*	PAIRED DATA ANALYSIS	*	H	H	W	W	F	E	R	R	F	C
*	SUMMARY STATISTICS	*	H	H	WW	WW	FFF	EEE	RRR	FFF	C	
*		*	H	H	W	W	F	E	R	R	R	C
*		*	H	H	W	W	F	EEE	R	R	R	CCCC

## COMMENTS:

PERCENT DIFFERENCE:  $((MFR - EPA)/EPA) \times 100\%$  - GASOLINE ONLY -

\*\*\*\*\*

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE																		
RANDOM AUDIT			FAILURE AT MFR			FE UP BY 1 OR MORE			NEW VEHICLE			FE CORR OFFSET			ALL OTHERS			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYS	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-2.77	0.00
30 FORD	1	2.52	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	1.43	0.08
40 GM	4	0.78	1.91	0	0.00	0.00	1	0.45	0.00	0	0.00	0.00	0	0.00	0.00	13	-1.17	2.11
196 DSM	1	-1.69	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
251 GKAUT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-1.46	0.00	0	0.00	0.00	0	0.00	0.00
420 PRSCH	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	-1.24	1.53
590 V W	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	6.19	0.00
600 VOLVO	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	-0.74	0.14	0	0.00	0.00	0	0.00	0.00
ALL	6	0.66	2.00	0	0.00	0.00	1	0.45	0.00	3	-0.98	0.43	0	0.00	0.00	19	-0.60	2.58
PERCENT DIFFERENCE:	$((MFR - EPA)/EPA) \times 100\%$											- DIESEL ONLY -						
*****																		
590 V W	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-3.13	0.00
ALL	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-3.13	0.00



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ANN ARBOR, MICHIGAN 48105

September 20, 1991

A - 91-46

IV-B-2

OFFICE OF  
AIR AND RADIATION

MEMORANDUM

SUBJECT: Paired Data Report - July 1991.

FROM: Robert Gilkey *Robert Gilkey*  
 Correlation and Engineering Services

TO: Eldert Bontekoe, Team Leader  
 Certification Branch

THRU: Martin Reineman, Manager *MR*  
 Correlation and Engineering Services

Attached is the paired data report for July 1991. The findings of this analysis are as follows:

1. Overall FTP fuel economy percent differences continue near zero and FTP emission offsets continue to be acceptable. HFET fuel economy differences exceeded +1.6%. This magnitude was unusual and could have been in part due to a bias on MVEL analyzer A001.
2. Ford has brought its FTP fuel economy average to under +0.5% for July while its HFET fuel economy remains near +1.0%.
3. Chrysler's FTP fuel economy offset for July was +0.5% for two tests. A single HFET test in July was +3.7%.

If you have additional questions on this report, please contact me at X397.

Attachments

cc: T. Ball  
 D. Danyko  
 R. Montgomery  
 D. Perkins  
 R. Lawrence  
 T. Schrodt  
 J.D. Carpenter  
 J.T. White  
 B. Kolowich  
 M. Caldwell

0242g

Technical Report

Paired Data Report July 1991

Robert Gilkey  
September 20, 1991

Program Development & Quality Staff  
U.S. Environmental Protection Agency  
2565 Plymouth Road  
Ann Arbor, MI 48105

This report presents the paired data for July 1991. Recent improvements in access to historic paired data now allow a somewhat different format for these reports. Historic data as well as current data will now be used to improve the usefulness and consistency of the report. Comments will now consider the last three months of data, where appropriate, as well as that of the reporting month. Finally, specialized stratifications and recalculations will be used to clarify and expand on selected items as warranted. The summary statistics in the Appendices are still presented for the reporting month only.

The data are summarized in the following attachments:

Attachment A	Monthly Paired Data Status Graphs.
Attachment B	Manufacturer Paired Data Status Graphs.
Attachment C	Data Presentation Methodology.
Appendix 1	Testing Summary.
Appendix 2	Absolute Differences and Percent Differences for the FTP.
Appendix 3	Absolute Differences and Percent Differences for the HFET.
Appendix 4	Evaporative Emission Data.
Appendix 5	Roadload Data.
Appendix 6	Absolute Differences and Percent Differences by Site.
Appendix 7	FTP MPG and HFET MPG Percent Differences by Reason for Confirmation.

Attachment A displays monthly means and three month running averages of data from the three months ending July 1991. Attachment B contains monthly means and three month running averages of FTP and HFET fuel economy percent differences for Chrysler, Ford, GM and the combined averages of other manufacturers. Attachment C presents the data stratification used and screening limits applied to data for presentation in the other attachments. The Appendices present the paired data summary statistics.

#### Conclusions:

1. Overall FTP fuel economy percent differences continue near zero and FTP emission offsets continue to be acceptable. HFET fuel economy differences exceeded +1.6%. This magnitude was unusual and could have been in part due to a bias on MVEL analyzer A001.
2. Ford has brought its FTP fuel economy average to under +0.5% for July while its HFET fuel economy remains near +1.0%.
3. Chrysler's FTP fuel economy offset for July was +0.5% for two tests. A single HFET test in July was +3.7%.

-2-

Discussion:

Statistical Observations:

Table 1 lists manufacturers' offsets which exceeded the levels listed in Attachment C and showed a statistically significant difference from EPA.

Table 1

Three Months Ending July 1991  
Percent Differences\* of Manufacturers

<u>Manufacturer</u>	FTP					HFET			
	<u>NUM**</u>	<u>HC</u>	<u>CO</u>	<u>NOX</u>	<u>MPG</u>	<u>NUM</u>	<u>MPG</u>	<u>NUM</u>	<u>CDT</u>
Chrysler	45/35			-13.4	+2.0				
Hyundai						5		+1.8	
Isuzu						7		+2.4	
Saab						15		+2.0	

\* Percent difference = ((MFR-EPA)/EPA) x 100

\*\* Emission tests/Fuel Economy tests

Chrysler is working with EPA to determine the cause of the fuel economy offset flagged here. A correlation program with the Chrysler JTE test facility was completed at EPA on August 29. It showed no laboratory to laboratory differences.

Both Hyundai and Isuzu show abnormally high HFET fuel economy variability. More than one high value is evident for each and there are no obvious reasons for them.

Eleven of fifteen SAAB HFET tests had positive offsets which contributed to their overall offset with EPA.

Combined Manufacturer's Results:

Attachment A shows acceptable overall FTP emission running averages.

Both the FTP and HFET MPG running averages remain near zero and are acceptable.

-3-

The high July HFET MPG percent difference (+1.6% excluding the "UP BY 1 OR MORE" reason for confirmation category) is general to most manufacturers. Part of the offset was probably due to a CO<sub>2</sub> span gas valve cross port leak on analyzer site A001. The leak resulted in artificially high CO<sub>2</sub> analysis results in diagnostic checks. If also present during bag analysis, this would lead to artificially low fuel economy results. This leak may have been intermittent and could have been present from May 28 to July 17. It was repaired July 17. Because all EPA equipment diagnostics and vehicle tests were in compliance with both CFR and EOD requirements throughout this period, the analysis in this report includes A001 results.

To estimate the influence of this cross port leak on other manufacturer's fuel economy results, the Ford paired data for April 1 to July 22 were manipulated to eliminate all A001 tests in the suspect period. The percent difference in FTP fuel economy decreased from +1.0% to +0.7% and the HFET fuel economy decreased from +0.9% to +0.8%. We anticipate that a control charting system for our daily analyzer diagnostic check will lead to earlier detection of such problems in the future.

#### Selected Manufacturers Results:

Attachment B shows that Ford has a positive FTP monthly fuel economy bias for July, but it is now well below +1%. Ford's three month average FTP fuel economy difference is now +0.6% (excluding the "UP BY 1 OR MORE" reason for confirmation category). A positive HFET fuel economy trend has continued since September 1990 and now has a three month running average of +1.1%.

In an effort to resolve the differences, Ford participated in a correlation program with us to help clarify the causes of this long term offset. No single cause was found during the program. After correcting the site A001 problems and controlling known sources of variability, the Ford/EPA correlation program showed the FTP and HFET differences to be about 0.4% and 1.0% respectively. Inspection of laboratory diagnostic data at each facility did not reveal any significant biases which would account for these differences. The remaining differences were not thought to be of practical significance.

Chrysler reduced its positive FTP fuel economy offset. Their July FTP average was down to +0.5% (based on two tests and excluding the "UP BY 1 OR MORE" category) though their running average remains high at +2.9% due to the low number of recent tests. The HFET fuel economy offset for July is +3.7%, but only one test is represented. The HFET running average remains reasonable at +0.8%. The two FTP tests were split between CPG and JTE and the HFET was run at CPG. The results of a recently completed correlation program between EPA and the Chrysler JTE laboratory did not show evidence of a laboratory offset.

-4-

**Paired Data Summary Statistics:**

The following tests data were excluded from the summary statistics in the Appendix:

July Paired Data Rejected for Exceeding Screening Limits

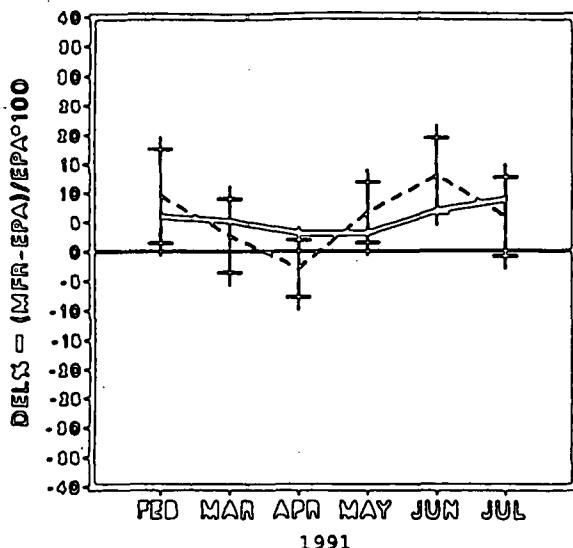
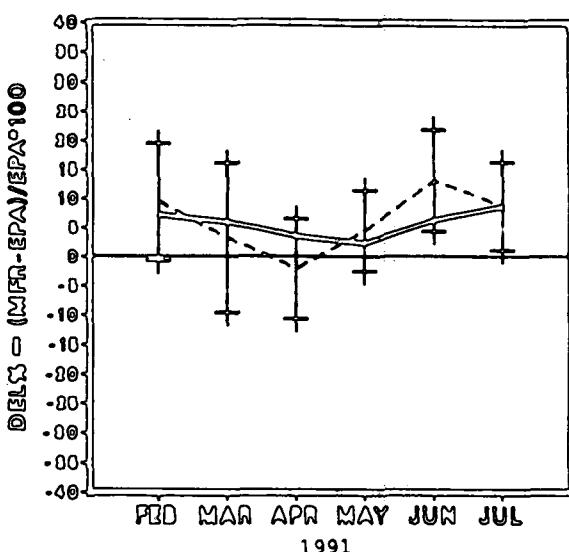
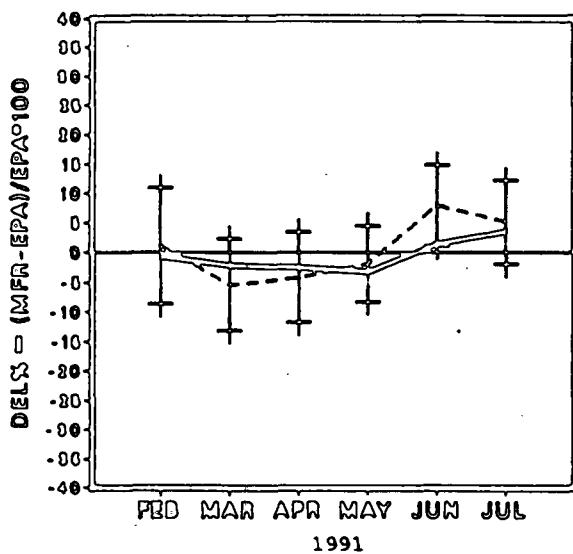
<u>Mfr</u>	<u>Vehicle ID</u>	<u>VI</u>	<u>Screening Parameter</u>	<u>Test Limit</u>	<u>Result</u>	<u>EPA Value</u>
Mercedes	V140E60-Z2028	0	%MPG	+15%	+55%	12.28
Honda	A921A2	5	%NOx	+100%	+113%	0.103

Mercedes transferred us the wrong FE values. The error was corrected.

If I can be of further assistance, please call on X 397.

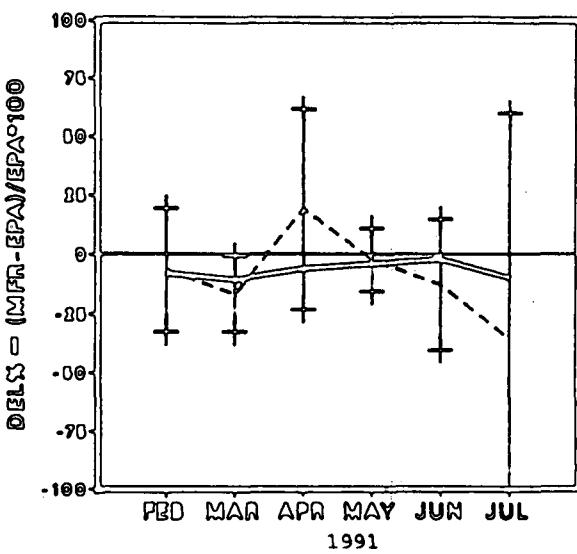
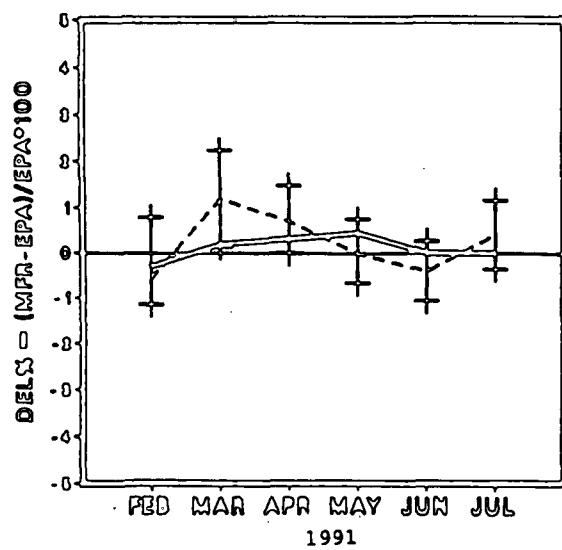
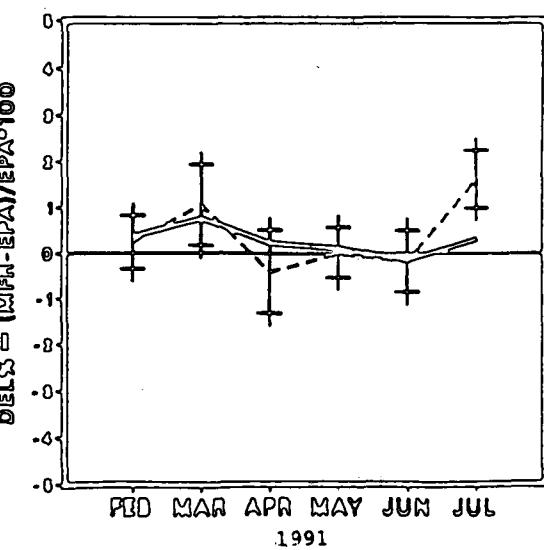
**Attachments**

**ATTACHMENT A**  
**Engineering Operations Division**  
**Monthly Paired Data Status Graphs**

**FTP HC****FTP CO****FTP NOX**

**Legend**

- MONTHLY MEAN ...
- RUNNING AVERAGE ...
- + 95% Confidence Interval

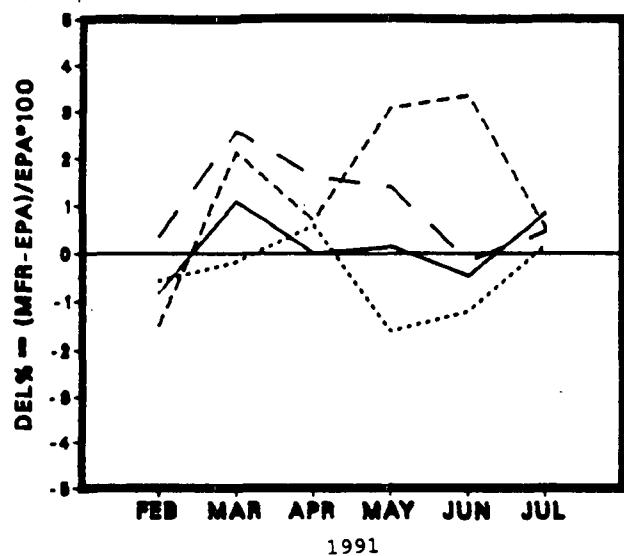
**EVAPORATIVE EMISSIONS****FTP MPG****HFET MPG**

## ATTACHMENT B

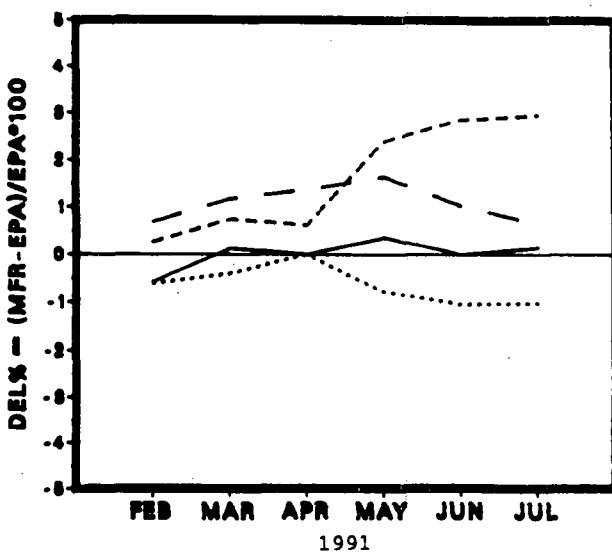
## Engineering Operations Division

## Manufacturer Paired Data Status Graphs

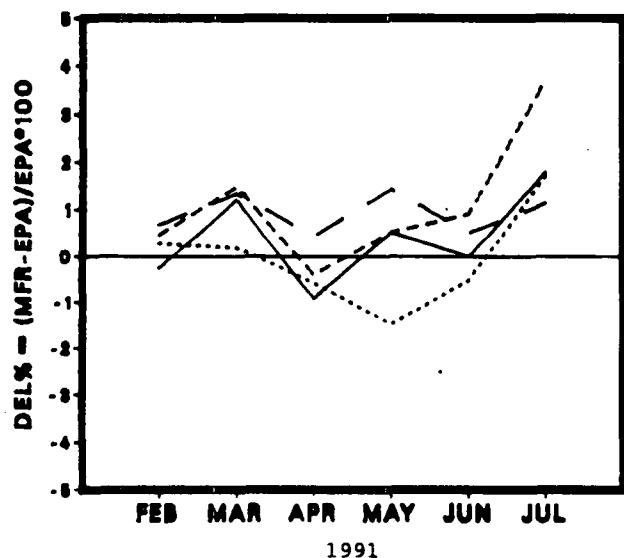
**FTP MPG**  
MONTHLY MEANS



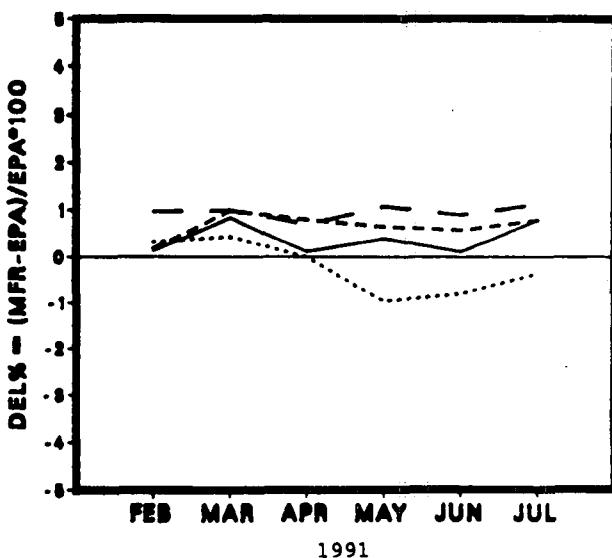
**FTP MPG**  
THREE MONTH RUNNING AVERAGE



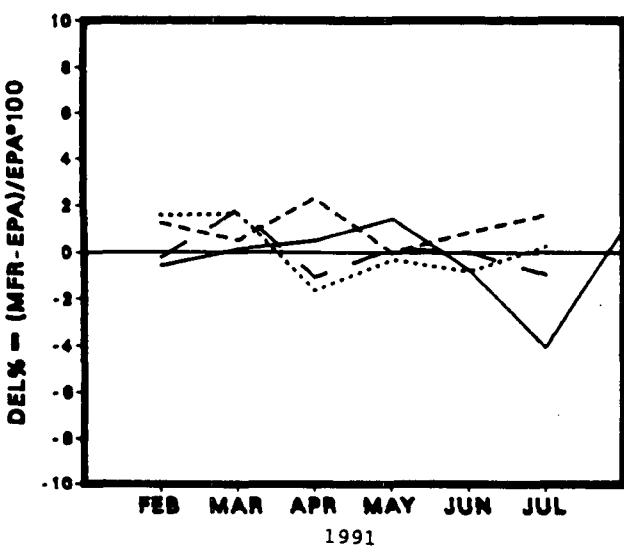
**HFET MPG**  
MONTHLY MEANS



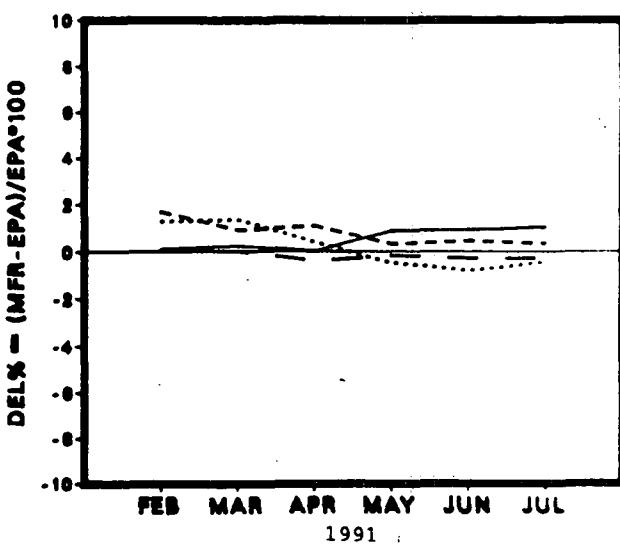
**HFET MPG**  
THREE MONTH RUNNING AVERAGE



**QUICKCHECK COASTDOWN**  
MONTHLY MEANS



**QUICKCHECK COASTDOWN**  
THREE MONTH RUNNING AVERAGE



## Legend

- GM
- FORD
- CHRYSLER
- OTHERS....

ATTACHMENT CEngineering Operations Division  
Data Presentation Methodology

## Table Preparation:

Table 1 is developed using a paired t-test at the 95% confidence level. The paired t-test is based on analysis of the last test pairs with no paired data screens. All confirmation code strata are used for emission analysis, while fuel economy analysis excludes the "UP BY 1 OR MORE" reason for confirmation stratum. The table lists those tests which differ from EPA at the 95% confidence level and exceed the limits below.

HC	-10%
CO	-10%
NOx	-10%
FTP Fuel Economy	+1.5%
HFET Fuel Economy	+1.5%
Quickcheck Coastdown Time	+2.0%

## Graph Preparation:

Attachment A emission status graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE up by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

-2-

**Summary Statistics Preparation:**

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

Paired Data Rejection Criteria

FTP

	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg	Evap g
Upper	0.75	6.0	65.0	0.75	3.2	
Lower	-0.75	-6.0	-65.0	-0.75	-3.2	

FTP (% Difference)

Upper	135.0	160.0	15.0	100.0	15.0	*
Lower	-99.0	-99.0	-15.0	-99.0	-15.0	*

HFET

	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg	CDT sec
Upper	0.2	6.0	45.0	1.0	4.5	
Lower	-0.2	-6.0	-45.0	-1.0	-4.5	

HFET (% Difference)

Upper			15.0	15%
Lower			-15.0	-15%

\* Values to be set in revised paired data program currently under development.

**Appendix 1**

PROCESSED: 10:41:49 AUG 6, 1991

CCID: SN8Z

PROJECT: 7030

NAME: RKG

*****	*	TTTTT	EEEEEE	SSSSS	TTTTT	SSSSS	U	U	M	M	SSSSS	
*	*	T/	E	S	T	S	U	U	MM	MM	S	
*	PAIRED DATA ANALYSIS	*	T	EEE	SSSSS	T	SSSSS	U	U	M	M	SSSSS
*	SUMMARY STATISTICS	*	T	E	S	T	S	U	U	M	M	S
*	*	T	EEEEEE	SSSSS	T	SSSSS	UUU	M	M	SSSSS		
*****												

PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91

TEST TYPE(S): EMISSION DATA FUEL ECONOMY

PAIR TYPE: EPA:MFR

ANALYZER(S): ALL

MODEL YEAR(S): ALL

DYNAMOMETER(S): ALL

FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL EVAP CLASS: EVAP AND NON EVAP

VEHICLE ADJUSTMENT: ALL VEHICLES

HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

COMMENTS: JULY 91-LAST ONLY

	FTP		HWFE	
	GAS *****	DIESEL *****	GAS *****	DIESEL *****
A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS	48	0	53	0
B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS	2	0	0	0
C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA	4	0	11	0
D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE	4	0	7	0
E. NUMBER OF VOID EPA TESTS	9	0	2	0
TOTAL NUMBER OF EPA TESTS IN THIS PERIOD	67	0	73	0
PAIRS MADE = (A+B+C)	54	0	64	0
POSSIBLE PAIRS = (A+B+C+D)	58	0	71	0
PERCENT PAIRED: ((A+B+C)/PPAIRS)*100%	93.1	0.0	90.1	0.0
PERCENT NOT PAIRED: (D/PPAIRS)*100%	6.9	0.0	9.9	0.0
	100.0	0.0	100.0	0.0

## Appendix 2

PROCESSED: 10:41:50 AUG 6, 1991

PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91

PAIR TYPE: EPA:MFR

```
*****
*          *      FFFFF   TTTTT   PPPP   DDDD   EEEE   L
*          PAIRED DATA ANALYSIS   *      F       T      P   P   D   D   E   L
*          *      FFF     T      PPPP   D   D   EEE   L
*          SUMMARY STATISTICS   *      F       T      P   D   D   E   L
*          *      F       T      P      DDDD   EEEE   LLLL
*****
```

COMMENTS: JULY 91-LAST ONLY

SIGNED DIFFERENCES: (MFR - EPA)

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	2	0.015	0.057	2	0.28	0.13	2	2.7	8.8	2	0.025	0.069	2	0.14	0.28
30 FORD	12	-0.028	0.058	12	-0.24	0.36	12	-2.3	9.8	12	-0.019	0.102	12	0.13	0.38
40 GM	10	0.032	0.045	10	0.14	0.31	10	-2.7	11.1	10	-0.055	0.054	10	0.17	0.43
200 MBZ	6	-0.015	0.022	6	0.01	0.23	6	-7.7	4.8	6	-0.001	0.032	6	0.10	0.21
260 HONDA	6	0.010	0.012	6	0.05	0.25	6	-5.1	3.2	6	0.030	0.033	6	0.82	0.66
290 ISUZU	4	0.052	0.048	4	0.90	0.44	4	18.8	4.3	4	0.154	0.100	4	-0.49	0.14
420 PRSCH	2	0.010	0.030	2	0.23	0.24	2	-9.4	1.6	2	-0.009	0.003	2	0.16	0.07
470 SAAB	4	0.050	0.046	4	0.33	0.46	4	2.6	22.2	4	0.009	0.045	4	0.34	0.70
540 SUZUK	1	-0.003	0.000	1	0.04	0.00	1	20.4	0.0	1	-0.008	0.000	1	-1.28	0.00
570 TOYOT	1	0.050	0.000	1	0.28	0.00	1	-4.3	0.0	1	0.140	0.000	1	0.05	0.00
ALL	48	0.010	0.050	48	0.11	0.43	48	-0.9	11.9	48	0.005	0.086	48	0.16	0.54

## Appendix 2-b

PROCESSED: 10:41:50 AUG 6, 1991

PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91

PAIR TYPE: EPA:MFR

	*****	FFFFF	TTTTT	PPPP	PPPP	CCCC	TTTTT
	*	F	T	P	P	C	T
	*	FFF	T	PPPP	PPPP	C	T
	*	F	T	P	P	C	T
	*	F	T	P	P	CCCC	T
	*****						

COMMENTS: JULY 91-LAST ONLY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

\*\*\*\*\*

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	2	18.0	35.3	2	7.1	5.7	2	0.08	1.35	2	1.9	10.7	2	0.54	1.46
30 FORD	12	-7.6	20.5	12	-8.0	22.5	12	-0.38	1.93	12	-3.5	17.6	12	0.70	2.01
40 GM	10	12.8	17.5	10	10.7	21.9	10	-0.53	2.19	10	-8.5	11.6	10	1.03	2.35
200 MBZ	6	-14.6	18.8	6	-0.9	19.8	6	-1.54	1.06	6	10.6	15.0	6	0.51	1.14
260 HONDA	6	8.4	9.7	6	7.6	28.3	6	-2.01	1.21	6	10.8	9.6	6	2.15	1.67
290 ISUZU	4	27.8	32.4	4	54.4	17.3	4	3.93	0.82	4	39.3	28.2	4	-2.67	0.78
420 PRSCH	2	5.0	16.7	2	17.4	18.3	2	-1.89	0.31	2	-7.0	2.0	2	0.90	0.40
470 SAAB	4	25.8	25.5	4	19.4	23.8	4	0.71	5.18	4	3.4	32.3	4	1.58	3.40
540 SUZUK	1	-1.9	0.0	1	4.2	0.0	1	5.90	0.00	1	-6.8	0.0	1	-5.00	0.00
570 TOYOT	1	25.1	0.0	1	18.9	0.0	1	-0.96	0.00	1	93.3	0.0	1	0.25	0.00
ALL	48	5.9	23.4	48	8.7	26.0	48	-0.23	2.65	48	5.2	24.4	48	0.59	2.30

XX . XX )

XX . X ✓

✓ M

XX . X ✗

E

### Appendix 3

PROCESSED: 10:41:52 AUG 6, 1991  
 PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91  
 PAIR TYPE: EPA:MFR

\*\*\*\*\*  
 \* H H W W FFFFF EEEEE DDDDD EEEEE L  
 \* PAIRED DATA ANALYSIS \* H H W W F E D D E L  
 \* HHHHH W W W FFF EEE D D EEE L  
 \* SUMMARY STATISTICS \* H H WW WW F E D D E L  
 \* H H W W F EEEEE DDDDD EEEEE LLLLLL  
 \*\*\*\*\*

COMMENTS: JULY 91-LAST ONLY

SIGNED DIFFERENCES: (MFR - EPA)

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	1	0.014	0.000	1	0.22	0.00	1	-6.8	0.0	1	0.018	0.000	1	1.24	0.00
30 FORD	13	-0.007	0.010	13	0.02	0.07	13	-3.1	6.8	13	-0.012	0.102	13	0.26	0.44
40 GM	16	0.001	0.045	16	0.04	0.55	16	-3.6	5.7	16	-0.053	0.072	16	0.47	0.66
200 MBZ	6	-0.003	0.031	6	-0.00	0.09	6	-9.6	4.6	6	0.006	0.012	6	-0.71	3.00
260 HONDA	7	-0.001	0.011	7	-0.00	0.04	7	-2.6	4.2	7	0.037	0.113	7	1.12	1.60
290 ISUZU	4	-0.041	0.024	4	0.05	0.10	4	-2.3	11.4	4	0.141	0.290	4	0.47	0.67
420 PRSCH	2	-0.012	0.005	2	-0.11	0.04	2	0.4	3.7	2	-0.030	0.003	2	-0.31	0.28
470 SAAB	2	-0.008	0.023	2	0.02	0.12	2	-9.6	15.4	2	-0.002	0.008	2	1.30	0.42
540 SUZUK	1	-0.021	0.000	1	-0.10	0.00	1	8.9	0.0	1	0.006	0.000	1	-0.92	0.00
570 TOYOT	1	-0.058	0.000	1	-0.07	0.00	1	-12.5	0.0	1	0.437	0.000	1	1.12	0.00
ALL	53	-0.007	0.031	53	0.02	0.30	53	-4.0	6.9	53	0.005	0.129	53	0.37	1.30

### Appendix 3-b

PROCESSED: 10:41:52 AUG 6, 1991  
 PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91  
 PAIR TYPE: EPA:MFR

```
*****
*          * H H W W FFFFFF EEEEE PPPP CCCC TTTT
* PAIRED DATA ANALYSIS * H H W W F E P P C T
*          ? HHHHH W W W FFF EEE PPPP C T
* SUMMARY STATISTICS * H H WW WW F E P C T
*          * H H W W F EEEEE P CCCC T
*****
```

COMMENTS: JULY 91-LAST ONLY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	1	73.7	0.0	1	32.4	0.0	1	-2.60	0.00	1	14.8	0.0	1	3.69	0.00
30 FORD	13	-14.3	17.7	13	16.3	50.4	13	-0.92	1.76	13	2.4	33.6	13	0.97	1.77
40 GM	16	14.0	63.7	16	74.4	135.4	16	-1.12	2.07	16	-25.0	26.7	16	1.65	2.02
200 MBZ	6	-17.3	39.3	6	-13.1	28.3	6	-2.59	1.20	6	48.3	85.1	6	-4.25	15.50
260 HONDA	7	-12.5	27.6	7	23.5	61.4	7	-1.48	2.34	7	113.4	182.4	7	1.86	2.51
290 ISUZU	4	-74.0	19.4	4	236.0	457.5	4	-0.52	2.91	4	225.1	235.1	4	2.13	3.02
420 PRSCH	2	-42.2	16.1	2	-27.1	10.0	2	0.14	1.22	2	-33.3	2.1	2	-1.06	0.93
470 SAAB	2	-1.2	39.4	2	-43.0	80.6	2	-2.91	4.82	2	-1.1	13.0	2	4.37	2.05
540 SUZUK	1	-15.3	0.0	1	-12.2	0.0	1	3.46	0.00	1	150.0	0.0	1	-2.67	0.00
570 TOYOT	1	-81.7	0.0	1	-100.0	0.0	1	-3.93	0.00	1	900.0	0.0	1	4.02	0.00
ALL	53	-10.5	48.1	53	45.0	151.6	53	-1.26	2.18	53	49.3	166.9	53	0.88	5.57

## Appendix 4

PROCESSED: 10:41:51 AUG 6, 1991  
 PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91  
 PAIR TYPE: EPA:MFR

\*\*\*\*\*  
 \* EEEEE V V AAA PPPP DDDD AAA TTTT AAA  
 \* E V V A A P P D D A A T A A  
 \* EEE V V AAAAA PPPP D D AAAAA T AAAAAA  
 \* E V V A A P D D A A T A A  
 \* EEEEE V A A P DDDD A A T A A  
 \*\*\*\*\*

COMMENTS: JULY 91-LAST ONLY

### DATA AND DIFFERENCES:

EPA GM/TEST			(M-E) DIURNAL			(M-E) H. SOAK			(M-E) TOTAL			(M-E)/E % DIFF			EPA SOAK			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYS	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
30 FORD	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
40 GM	3	0.62	0.32	3	-0.27	0.43	3	-0.01	0.02	3	-0.28	0.44	3	-30.6	43.0	3	20.0	1.0
200 MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
260 HONDA	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
290 ISUZU	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
420 PRSCH	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
470 SAAB	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
540 SUZUK	1	0.27	0.00	1	-0.06	0.00	1	0.01	0.00	1	-0.05	0.00	1	-17.9	0.0	1	19.0	0.0
570 TOYOT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
ALL	4	0.53	0.32	4	-0.22	0.37	4	-0.00	0.02	4	-0.22	0.38	4	-27.4	35.7	4	19.8	1.0
BY SHED: (EPA TESTS)																		
S001	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
S002	3	0.62	0.32	3	-0.27	0.43	3	-0.01	0.02	3	-0.28	0.44	3	-30.6	43.0	3	20.0	1.0
S003	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0	0.0	0.0
S004	1	0.27	0.00	1	-0.06	0.00	1	0.01	0.00	1	-0.05	0.00	1	-17.9	0.0	1	19.0	0.0
ALL	4	0.53	0.32	4	-0.22	0.37	4	-0.00	0.02	4	-0.22	0.38	4	-27.4	35.7	4	19.8	1.0

## Appendix 5

PROCESSED: 10:41:52 AUG 6, 1991

PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91

PAIR TYPE: EPA:MFR

```
*****
*          RRRR   000   AAA   DDDD   L   000   AAA   DDDD
*          R   R   0   0   A   A   D   D   L   0   0   A   A   D   D
*          RRRR   0   0   AAAAA   D   D   L   0   0   AAAAA   D   D
*          R   R   0   0   A   A   D   D   L   0   0   A   A   D   D
*          R   R   000   A   A   DDDD   LLLL   000   A   A   DDDD
*****
```

COMMENTS: JULY 91-LAST ONLY

COASTDOWN DATA:

\*\*\*\*\*

### - GASOLINE TESTS -

MFR TRK			MFR QCHK			EPA QCHK			(MFR-EPA)			((M-E)/E)%				
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV				
20	CHRYS	1	15.59	0.00	1	15.76	0.00	1	15.51	0.00	1	0.25	0.00	1	1.61	0.00
30	FORD	13	15.04	1.35	13	15.07	1.64	13	18.17	10.89	13	-3.10	10.58	13	-6.49	19.45
40	GM	16	16.47	1.60	16	16.86	1.84	16	16.67	1.80	16	0.18	0.34	16	1.10	2.10
200	MBZ	6	17.24	0.99	6	16.66	0.61	6	16.65	0.62	6	0.00	0.18	6	0.02	1.13
260	HONDA	7	17.07	1.19	7	17.03	1.59	7	16.54	1.29	7	0.48	0.41	7	2.82	2.63
290	ISUZU	4	12.27	0.01	4	12.63	0.05	4	12.41	0.11	4	0.21	0.15	4	1.72	1.24
420	PRSCH	2	15.68	0.00	2	13.79	0.35	2	14.59	0.13	2	-0.80	0.23	2	-5.49	1.60
470	SAAB	2	15.04	0.95	2	14.82	1.99	2	14.91	2.31	2	-0.08	0.32	2	-0.41	2.07
540	SUZUK	1	11.66	0.00	1	11.54	0.00	1	11.20	0.00	1	0.34	0.00	1	3.04	0.00
570	TOYOT	1	14.93	0.00	1	15.05	0.00	1	14.75	0.00	1	0.30	0.00	1	2.03	0.00
ALL		53	15.75	1.87	53	15.75	2.02	53	16.39	5.61	53	-0.64	5.29	53	-0.85	10.13

## Appendix 6

PROCESSED: 10:41:51 AUG 6, 1991  
 PERIOD OF ANALYSIS: 7- 1-91 TO 7-31-91  
 PAIR TYPE: EPA:MFRI

SIGNED DIFFERENCES: ( MFRI - EPA )

COMMENTS: JULY 91-LAST ONLY

SIGNED DIFFERENCES: ( MFRI - EPA )										- ALL FUELS -											
TP	SITE	HC				CO				CO2				NOX				MPG			
		NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	AMC	CHR	FRD	GM	OTHR
FTP	D001	11	0.007	0.026	11	-0.01	0.26	11	-7.29	7.47	11	-0.008	0.053	11	0.62	0.53	0	1	0	4	6
	D002	16	0.001	0.058	16	0.08	0.42	16	-3.17	14.62	16	0.005	0.048	16	0.17	0.56	0	1	4	2	9
	D003	10	0.001	0.037	10	0.15	0.48	10	1.35	8.31	10	0.008	0.127	10	0.03	0.40	0	0	4	0	6
	D004	9	0.038	0.069	9	0.36	0.47	9	6.93	10.44	9	0.008	0.106	9	-0.23	0.27	0	0	2	4	3
	D005	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	D006	2	0.006	0.011	2	-0.33	0.43	2	5.90	11.74	2	0.038	0.211	2	-0.16	0.42	0	0	2	0	0
	D007	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
ALL		48	0.010	0.050	48	0.11	0.43	48	-0.90	11.87	48	0.005	0.086	48	0.16	0.54	0	2	12	10	24
A001		27	0.003	0.047	27	0.04	0.36	27	-4.85	12.20	27	-0.000	0.050	27	0.36	0.58	0	2	4	6	15
A002		19	0.019	0.056	19	0.25	0.48	19	3.99	9.55	19	0.008	0.114	19	-0.09	0.36	0	0	6	4	9
A003		2	0.006	0.011	2	-0.33	0.43	2	5.90	11.74	2	0.038	0.211	2	-0.16	0.42	0	0	2	0	0
A004		0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
ALL	ALL	48	0.010	0.050	48	0.11	0.43	48	-0.90	11.87	48	0.005	0.086	48	0.16	0.54	0	2	12	10	24
HWFE																					
D001		10	0.000	0.025	10	0.05	0.11	10	-7.94	6.19	10	-0.021	0.114	10	1.21	1.29	0	1	0	5	4
D002		15	-0.021	0.037	15	-0.12	0.41	15	-4.85	7.01	15	0.038	0.120	15	0.59	0.65	0	0	4	2	9
D003		10	-0.011	0.018	10	0.01	0.08	10	0.58	7.53	10	0.033	0.158	10	-0.12	0.47	0	0	3	1	6
D004		16	0.003	0.033	16	0.13	0.35	16	-4.99	4.11	16	-0.016	0.118	16	0.04	1.86	0	0	4	8	4
D005		0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
D006		2	-0.004	0.001	2	0.03	0.03	2	7.30	4.81	2	-0.093	0.226	2	-0.31	0.11	0	0	2	0	0
D007		0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
ALL		53	-0.007	0.031	53	0.02	0.30	53	-3.99	6.88	53	0.005	0.129	53	0.37	1.30	0	1	13	16	23
A001		25	-0.012	0.034	25	-0.05	0.33	25	-6.08	6.74	25	0.014	0.119	25	0.84	0.98	0	1	4	7	13
A002		26	-0.003	0.028	26	0.08	0.28	26	-2.85	6.18	26	0.003	0.134	26	-0.02	1.47	0	0	7	9	10
A003		2	-0.004	0.001	2	0.03	0.03	2	7.30	4.81	2	-0.093	0.226	2	-0.31	0.11	0	0	2	0	0
A004		0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
ALL		53	-0.007	0.031	53	0.02	0.30	53	-3.99	6.88	53	0.005	0.129	53	0.37	1.30	0	1	13	16	23

appendix 6-b

```

*****  

* PAIRED DATA ANALYSIS *  

* SUMMARY STATISTICS *  

*****  

PPPP  

P P CCCCC  

PPPP C TTTT SSSSS  

P C T SSSSS  

C CCCCC T SSSSS  

P T III T EEEEE  

C T EEE  

C T E  

CCCCC T EEEE

```

**PERCENT DIFFERENCES:**  $((MFR - EPA)/EPA) \times 100\%$

PERCENT DIFFERENCES:  $((MFR - EPA)/EPA) \times 100\%$  - ALL FUELS -

TP.	SITE	HC			CO			CO2			NOX			MPG			COUNT BY MFR GROUP		
		NUM	Avg	STDEV	AMC	CHR	FRD	GM	OTHR										
FTP	D001	11	3.2	19.9	11	-4.9	16.6	11	-1.85	1.73	11	5.7	15.3	11	2.42	1.55	0	1	0
	D002	16	3.3	25.0	16	10.8	25.7	16	-0.54	3.30	16	3.5	29.2	16	1.01	2.67	0	1	4
	D003	10	0.7	19.9	10	11.9	30.5	10	0.17	1.89	10	7.7	28.7	10	-0.23	1.34	0	0	6
	D004	9	20.2	28.4	9	24.2	23.4	9	1.46	2.07	9	3.3	23.2	9	-1.22	1.43	0	0	3
	D005	0	0.0	0.0	0	0.0	0.0	0	0.00	0.0	0	0.0	0.0	0	0.00	0.00	0	0	0
	D006	2	3.6	6.5	2	-19.0	22.3	2	1.43	2.49	2	11.8	28.7	2	-0.59	2.45	0	0	0
	D007	0	0.0	0.0	0	0.0	0.0	0	0.00	0.0	0	0.0	0.0	0	0.00	0.00	0	0	0
HWFE	ALL	48	5.9	23.4	48	8.7	26.0	48	-0.23	2.65	48	5.2	24.4	48	0.59	2.30	0	2	12
	A001	27	3.2	22.6	27	4.4	23.5	27	-1.07	2.80	27	4.4	24.4	27	1.59	2.35	0	2	4
	A002	19	9.9	25.6	19	17.7	27.4	19	0.78	2.03	19	5.6	25.6	19	-0.70	1.44	0	0	6
	A003	2	3.6	6.5	2	-19.0	22.3	2	1.43	2.49	2	11.8	28.7	2	-0.59	2.45	0	0	9
	A004	0	0.0	0.0	0	0.0	0.0	0	0.00	0.0	0	0.0	0.0	0	0.00	0.00	0	0	0
HWFE	ALL	48	5.9	23.4	48	8.7	26.0	48	-0.23	2.65	48	5.2	24.4	48	0.59	2.30	0	2	12
	D001	10	15.3	59.3	10	39.5	76.1	10	-2.85	2.26	10	12.5	50.7	10	3.34	2.32	0	1	5
	D002	15	-31.0	29.2	15	-10.3	62.9	15	-1.48	2.13	15	76.2	236.4	15	1.85	2.17	0	0	9
	D003	10	-21.3	33.6	10	119.1	292.5	10	0.38	2.22	10	101.0	196.0	10	-0.21	1.60	0	0	3
	D004	16	0.1	58.0	16	52.6	118.8	16	-1.46	1.15	16	22.8	122.7	16	-0.59	9.46	0	0	4
	D005	0	0.0	0.0	0	0.0	0.0	0	0.00	0.0	0	0.0	0.0	0	0.00	0.00	0	0	0
	D006	2	-18.1	13.7	2	55.6	62.9	2	1.84	0.79	2	-16.0	29.1	2	-1.38	0.83	0	0	0
	D007	0	0.0	0.0	0	0.0	0.0	0	0.00	0.0	0	0.0	0.0	0	0.00	0.00	0	0	0
ALL	ALL	53	-10.5	48.1	53	45.0	151.6	53	-1.26	2.18	53	49.3	166.9	53	0.88	5.57	0	1	13
	A001	25	-12.5	48.5	25	9.6	71.4	25	-2.03	2.24	25	50.8	186.0	25	2.45	2.31	0	1	7
	A002	26	-8.1	50.4	26	78.2	200.9	26	-0.75	1.85	26	52.9	156.1	26	-0.45	7.40	0	0	9
	A003	2	-18.1	13.7	2	55.6	62.9	2	1.84	0.79	2	-16.0	29.1	2	-1.38	0.83	0	0	0
	A004	0	0.0	0.0	0	0.0	0.0	0	0.00	0.0	0	0.0	0.0	0	0.00	0.00	0	0	0
ALL	ALL	53	-10.5	48.1	53	45.0	151.6	53	-1.26	2.18	53	49.3	166.9	53	0.88	5.57	0	1	13

## Appendix 7

PROCESSED: 10:41:51 AUG 6, 1991

PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91

PAIR TYPE: EPA:MFR

	*****	FFFFF	TTTTT	PPPP	RRRR	FFFFF	CCCC
	*	F	T	P P	R R	F	C
	*	FFFFF	T	PPPP	RRRR	FFFFF	C
	*	F	T	P	R R	R	C
	*	F	T	P	R R	R	CCCC
	*****	F	T	P	R R	R	

COMMENTS: JULY 91-LAST ONLY

PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %

- GASOLINE ONLY -

\*\*\*\*\*

RANDOM AUDIT			FAILURE AT MFR			FE UP BY 1 OR MORE			NEW VEHICLE			FE CORR OFFSET			ALL OTHERS			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYS	0	0.00	0.00	1	-0.49	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	1.58	0.00
30 FORD	5	0.83	2.63	0	0.00	0.00	0	1.92	1.89	0	0.00	0.00	0	0.00	0.00	5	0.08	1.43
40 GM	0	0.00	0.00	0	0.00	0.00	1	2.80	0.00	0	0.00	0.00	0	0.00	0.00	9	0.83	2.40
200 MBZ	1	-0.80	0.00	0	0.00	0.00	0	0.00	0.00	2	-0.28	0.40	0	0.00	0.00	3	1.47	0.55
260 HONDA	3	2.53	2.14	0	0.00	0.00	3	1.77	1.39	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
290 ISUZU	4	-2.67	0.78	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
420 PRSCH	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	0.90	0.40
470 SAAB	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	4	1.58	3.40
540 SUZUK	1	-5.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
570 TOYOT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	0.25	0.00
ALL	14	-0.34	2.96	1	-0.49	0.00	6	1.99	1.29	2	-0.28	0.40	0	0.00	0.00	25	0.89	2.01

**Appendix 7-b**

PROCESSED: 10:41:52 AUG 6, 1991  
 PERIOD OF ANALYSIS: 7-1-91 TO 7-31-91  
 PAIR TYPE: EPA:MFR

<code>*****</code> <code>*</code> <code>* PAIRED DATA ANALYSIS *</code> <code>*</code> <code>* SUMMARY STATISTICS *</code> <code>*</code> <code>*****</code>	<code>*</code> <code>H H W W FFFFFF EEEEE</code> <code>H H W W F E</code> <code>HHHHH W W W FFFF EEEE</code> <code>H H WW WW F E</code> <code>H H W W F EEEEE</code> <code>7</code>	<code>RRRR FFFFF CCCC</code> <code>R R F C</code> <code>RRRR FFFF C</code> <code>R R R C</code> <code>R R R CCCC</code>
--	---	---

COMMENTS: JULY 91-LAST ONLY

PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %

- GASOLINE ONLY -

\*\*\*\*\*

RANDOM AUDIT			FAILURE AT MFR			FE UP BY 1 OR MORE			NEW VEHICLE			FE CORR OFFSET			ALL OTHERS			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYS	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	3.69	0.00
30 FORD	7	2.12	1.25	0	0.00	0.00	1	-0.87	0.00	0	0.00	0.00	0	0.00	0.00	5	-0.27	1.39
40 GM	2	0.24	2.90	0	0.00	0.00	2	0.74	2.10	0	0.00	0.00	0	0.00	0.00	12	2.04	1.92
200 MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	3	-10.58	21.89	0	0.00	0.00	3	2.08	1.15
260 HONDA	3	1.31	1.81	0	0.00	0.00	4	2.27	3.14	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
290 ISUZU	4	2.13	3.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
420 PRSCH	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	-1.06	0.93
470 SAAB	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	4.37	2.05
540 SUZUK	1	-2.67	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
570 TOYOT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	4.02	0.00
ALL	17	1.48	2.19	0	0.00	0.00	7	1.38	2.68	3	-10.58	21.89	0	0.00	0.00	26	1.68	2.16



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ANN ARBOR, MICHIGAN 48105

August 9, 1991

A-91-46

IV-B-2

OFFICE OF  
AIR AND RADIATION

MEMORANDUM

SUBJECT: Third Quarter Paired Data Report - FY 91

FROM: Robert Gilkey *Robert Gilkey*  
Correlation and Engineering Services

TO: Eldert Bontekoe, Team Leader  
Certification Branch

THRU: *for* Martin Reineman, Manager *M.R.*  
Correlation and Engineering Services

Attached is the paired data report for the third quarter of FY 91. The findings of this analysis are as follows:

1. Ford continued their positive offset for both FTP and HFET fuel economy. The FTP difference was +1.3% and the HFET difference was +1.0% (both differences exclude the "UP BY 1 OR MORE" stratum per your request) for the quarter. Our efforts to resolve this offset are discussed in the report.

2. Chrysler shows a +2.8% offset in FTP fuel economy for the quarter. This offset is greatest at their JTE laboratory though the Chelsea proving grounds also shows an increase.

If you have additional questions on this report, please contact me.

Attachments

cc: R. Lawrence  
J. Carpenter  
J.T. White  
B. Kolowich  
P. Reece  
D. Danyko  
D. Perkins  
.T. Schrodт  
T. Ball  
R. Montgomery

Technical Report

Third Quarter Paired Data Report-FY 91

Robert Gilkey  
August 1991

Program Development & Quality Staff  
U.S. Environmental Protection Agency  
2565 Plymouth Road  
Ann Arbor, MI 48105

This report presents the paired data for the third quarter of fiscal year 1991.

The data are summarized in the following attachments:

Attachment A	Monthly Paired Data Status Graphs
Attachment B	Manufacturer Paired Data Status Graphs
Attachment C	Data Presentation Methodology
Appendix 1	Testing Summary
Appendix 2	Absolute Differences and Percent Differences for the FTP
Appendix 3	Absolute Differences and Percent Differences for the HFET
Appendix 4	Evaporative Emission Data
Appendix 5	Roadload Data
Appendix 6	Absolute Differences and Percent Differences by Site
Appendix 7	FTP MPG and HFET MPG Percent Differences by Reason for Confirmation

Attachment A displays monthly means and three month running averages of data from the second and third quarters of FY 91. Attachment B contains monthly means and three month running averages of FTP and HFET fuel economy percent differences for Chrysler, Ford, GM and the combined averages of other manufacturers. Attachment C presents the data stratification used and screening limits applied to data for presentation in the other attachments. The Appendices present the paired data summary statistics.

#### Conclusions

1. Ford continued their positive offset for both FTP and HFET fuel economy. The FTP difference was +1.3% and the HFET difference was +1.0% (both differences exclude the "UP BY 1 OR MORE" stratum per your request) for the quarter.

2. Chrysler shows a +2.8% offset in FTP fuel economy for the quarter. This offset is greatest at their JTE laboratory though the Chelsea proving grounds also shows an increase.

#### Discussion

##### Statistical Observations:

Table 1 lists manufacturers' offsets which exceeded the levels listed below and showed a statistically significant difference using a paired t-test at the 95% confidence level. The paired t-test is based on an analysis of last test pairs with no paired data screens. All confirmation code strata are used for emissions analysis, while fuel economy analysis excludes the "UP BY 1 OR MORE" reason for confirmation stratum.

HC	-10%
CO	-10%
NOx	-10%
FTP Fuel Economy	+1.5%
HFET Fuel Economy	+1.5%
Quickcheck Coastdown Time	+2.0%

-2-

Table 1

Second Quarter FY91  
Percent Differences of Manufacturers\*

<u>Manufacturer</u>	<u>FTP</u>				<u>HFET</u>			
	<u>NUM</u>	<u>HC</u>	<u>CO</u>	<u>NOx</u>	<u>MPG</u>	<u>NUM</u>	<u>MPG</u>	<u>NUM</u>
Chrysler	30		-11.3	-14.7	2.8			
Saab						15	1.6	

\* Percent difference = ((MFR-EPA)/EPA) x 100

The Chrysler CO and NOx entries are new and do not represent long term trends.

Chrysler's FTP fuel economy first exceeded our acceptability limits in May. Their HFET fuel economy does not support the magnitude of the FTP offset but does support the direction.

Eleven of fifteen SAAB HFET tests had positive offsets which contributed to their overall offset with EPA. One test at +6.5% (+2.1 mpg) contributed most. No correlation or other recent evidence is available to help determine the persistence or cause of this offset.

Ford is not represented because their offset does not exceed 1.5%.

Honda ended its positive CDT offset which had continued for over a year. Neither EPA nor Honda is aware of any changes which could account for this.

#### Combined Manufacturer's Results:

Attachment A presents combined monthly and running averages of paired data.

The manufacturers continue to show a positive HC and CO trend with respect to EPA. The trend is supported by the third quarter MVMA correlation program which shows both HC and CO averaging about 10% higher than EPA. The spring JAMA correlation does not support the trend because the manufacturers showed generally lower HC and CO.

The industry continued to average within one percent of EPA for both FTP and HFET fuel economy for the quarter.

#### Selected Manufacturer Results:

Attachment B displays fuel economy and quickcheck coastdown monthly means and running averages as a function of manufacturer.

-3-

Ford continued its positive fuel economy trends for both FTP and HFET tests. The trend is statistically significant for its persistence (nine months), and its magnitude (+1.3% for the FTP and +1.0% HFET tests this quarter). This trend is being investigated through a special correlation program with Ford. No cause has been determined yet though the tests support the trend. Previous paired data indicated that higher positive offsets occurred with rear wheel drive vehicles than with front wheel drive. Examination of the Ford paired data for this quarter does not show this effect.

Chrysler's FTP running average fuel economy has been positive for all of the six month period shown. Their monthly mean went negative only in February. The deviation has been nearly +3% for each of the last two months. The Chrysler highway fuel economy shows only a +1% deviation and has been relatively stable for the period. Closer investigation of the FTP fuel economy paired data shows that the Chelsea proving ground has a difference of +2.2%, and the JTE laboratory has a difference of +2.9% (excluding the "UP BY 1 OR MORE" category). Since Chrysler tests front drive vehicles almost exclusively at the proving grounds and rear drives at the JTE facility, it is not possible to examine their drive axle differences for each laboratory. The third quarter MVMA correlation does not support the magnitude of the offset. It shows +0.8% and +0.2% FTP fuel economy differences at their Chelsea proving ground (the vehicle was tested twice at this facility) and a +1.4% difference at their JTE laboratory.

#### Paired Data Summary Statistics:

Table 2 lists manufacturers data which were excluded from the status summary reports for exceeding one or more of the paired data rejection criteria in Attachment C.

Table 2

**Second Quarter FY91  
Tests Excluded for Exceeding Paired Data Rejection Criteria**

<u>Manufacturer</u>	<u>Vehicle ID</u>	<u>VI</u>	<u>Parameter</u>	<u>Screening Limit</u>	<u>Test Result</u>	<u>EPA Value</u>
Ford	2E1-5.8-F-464	00	FTP CO2	+65	+67.4	639.6 g/mi
Isuzu	N944-511	04	%FTP NOx	+100	185.7	0.175 g/mi
Liphardt	52499	00	%FTP NOx	+100	413.8	0.109 g/mi
Mitsubishi	EF2-Z730	00	%FTP NOx	+100	158.8	0.170 g/mi
Suzuki	89EDV-9	22	FTP MPG	-3.2	-3.3	47.3 mpg
Suzuki	89EDV-10	21	%FTP CO	+160	161.7	0.60 g/mi
Toyota	92-SXV1	00	%FTP CO	+160	167.2	0.61 g/mi

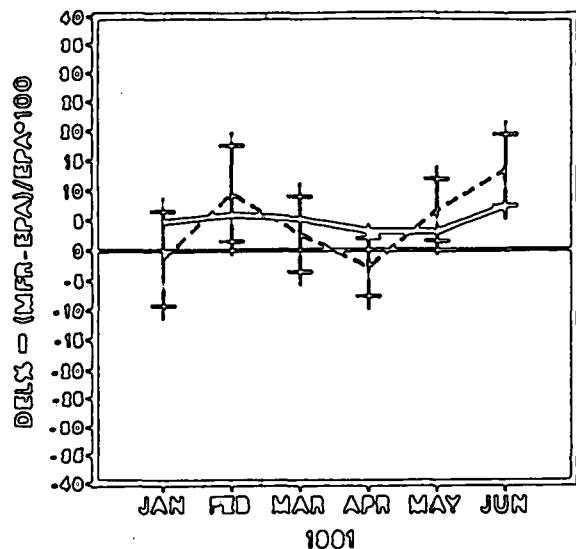
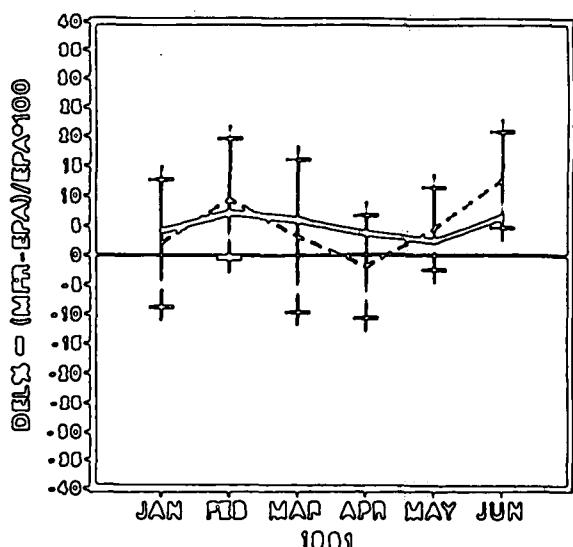
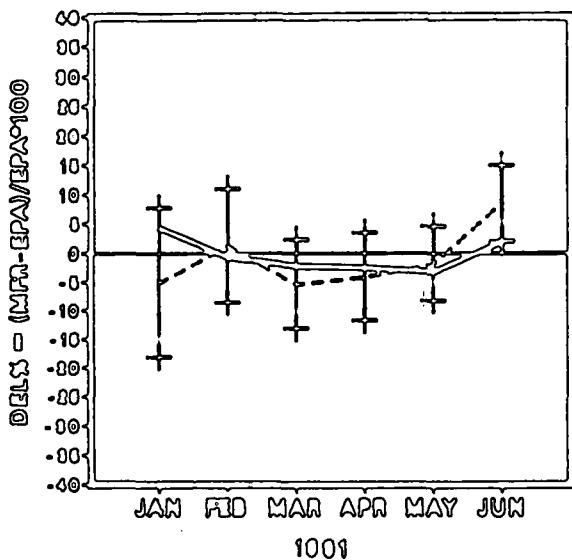
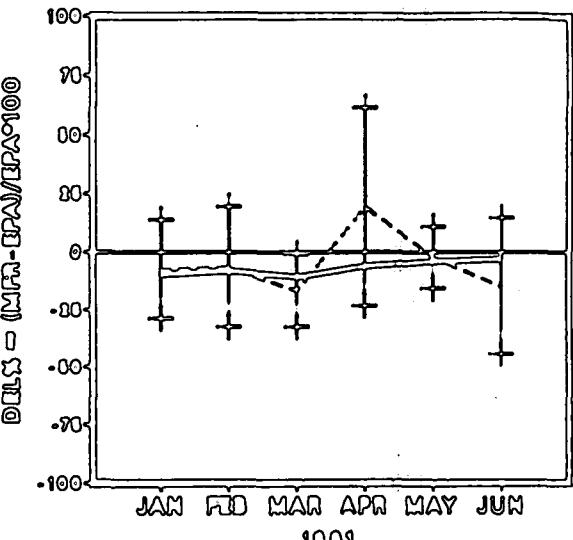
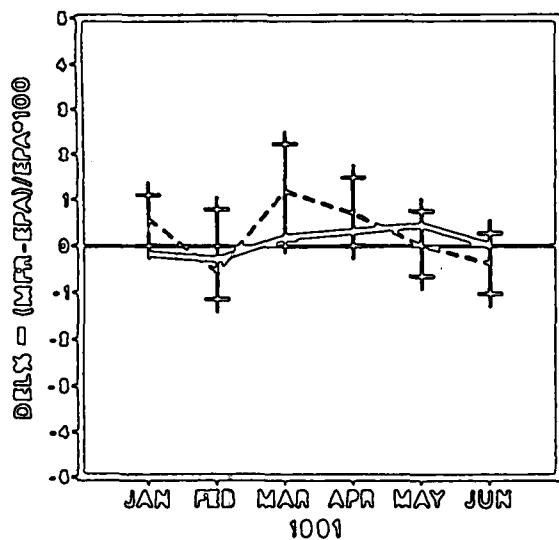
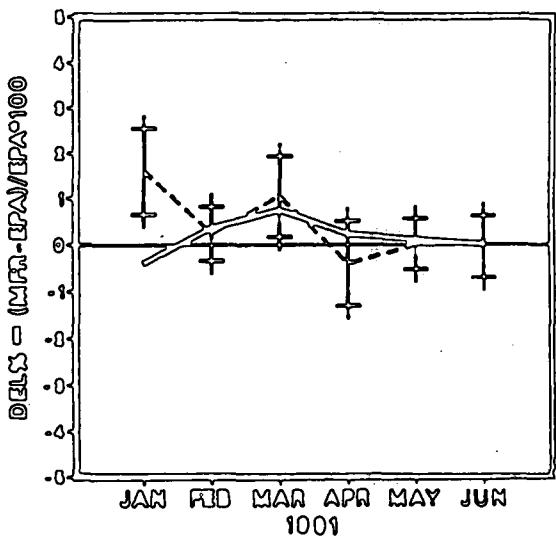
-4-

These tests were excluded from analysis in Attachments A and B and the Appendices.

The NOx and CO rejections represented tests having absolute values much lower than the current standards. They are also well below the Tier 1 standards and cannot be considered meaningful. The FTP fuel economy rejection is for a test with a high fuel economy and the percent difference is well within the rejection criteria. Ford's rejected FTP CO<sub>2</sub> was not retested and could not be confirmed.

Attachments

**ATTACHMENT A**  
**Engineering Operations Division**  
**Monthly Pollutant Data Status Graphs**

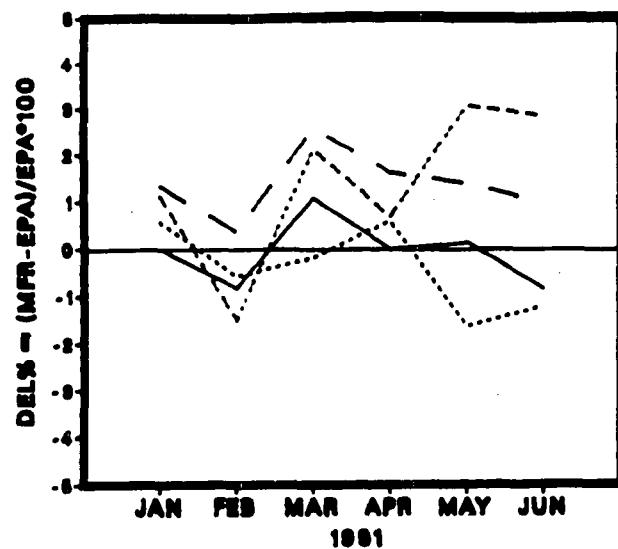
**FTP HC****FTP CO****FTP NOX****EVAPORATIVE EMISSIONS****FTP MPG****HFET MPG**

**Legend**

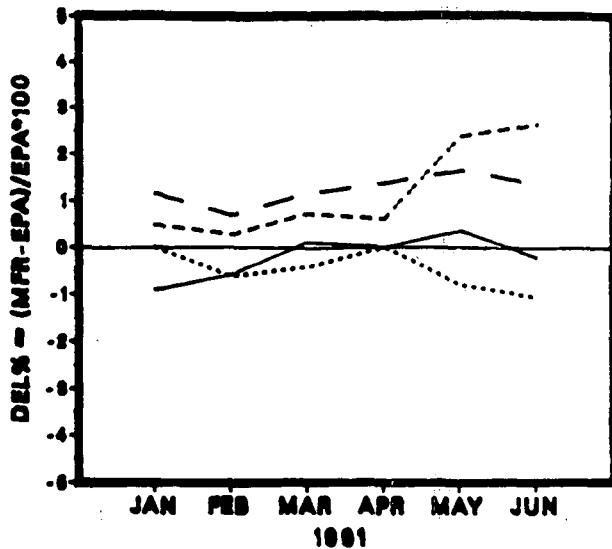
- MONTHLY MEAN** — Solid Line
- RUNNING AVERAGE** — Dashed Line
- CONFIDENCE INTERVAL** — Vertical Error Bars

**ATTACHMENT B**  
**Engineering Operations Division**  
**Manufacturer Paired Data Status Graphs**

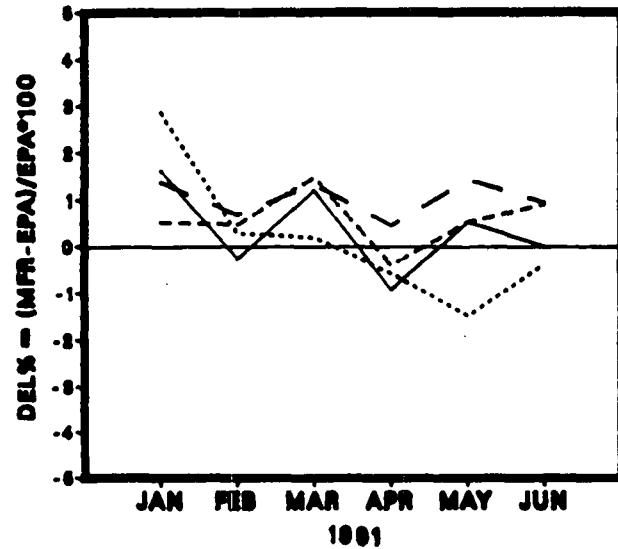
**FTP MPG  
MONTHLY MEANS**



**FTP MPG  
THREE MONTH RUNNING AVERAGE**

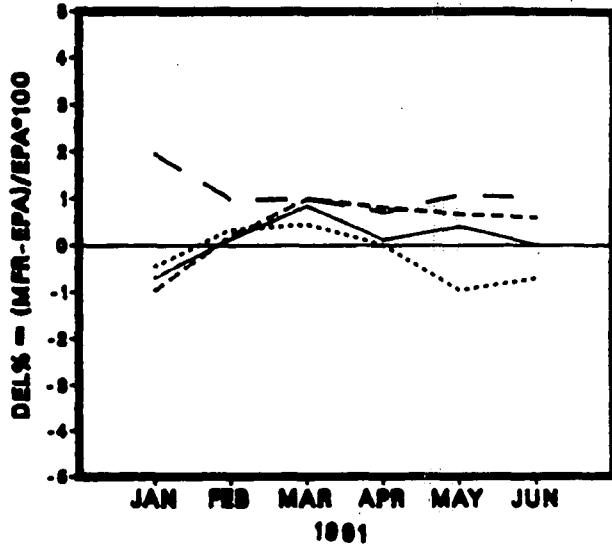


**HFET MPG  
MONTHLY MEANS**

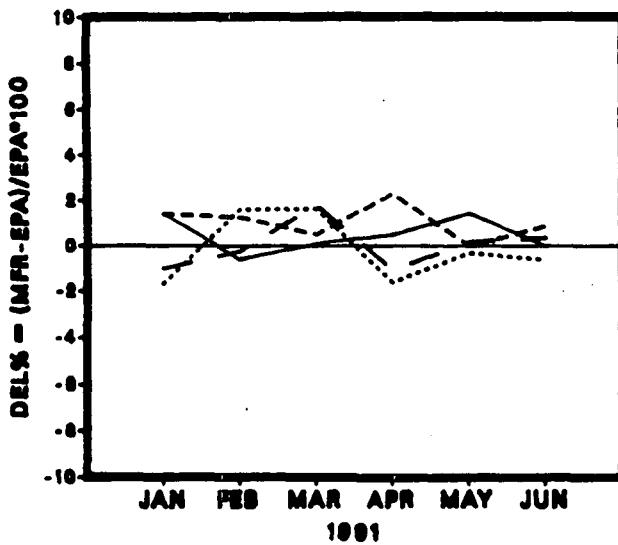


**Legend**  
GM  
FORD  
CHRYSLER  
OTHERS...

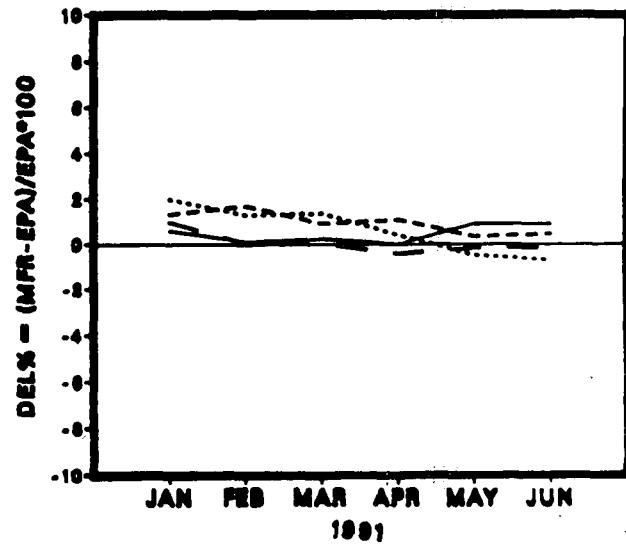
**HFET MPG  
THREE MONTH RUNNING AVERAGE**



**QUICKCHECK COASTDOWN  
MONTHLY MEANS**



**QUICKCHECK COASTDOWN  
THREE MONTH RUNNING AVERAGE**



ATTACHMENT C

Engineering Operations Division  
Data Presentation Methodology

**Graph Preparation:**

Attachment A emission status graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE up by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

**Summary Statistics Preparation:**

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

Paired Data Rejection Criteria

	<u>FTP</u>					
	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg	Evap g
Upper	0.75	6.0	65.0	0.75	3.2	
Lower	-0.75	-6.0	-65.0	-0.75	-3.2	

FTP (% Difference)

Upper	135.0	160.0	15.0	100.0	15.0	*
Lower	-99.0	-99.0	-15.0	-99.0	-15.0	*

-2-

HFET

	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg	CDT sec
Upper	0.2	6.0	45.0	1.0	4.5	
Lower	-0.2	-6.0	-45.0	-1.0	-4.5	

HFET (% Difference)

Upper		15.0	15%
Lower		-15.0	-15%

\* Values to be set in revised paired data program currently under development.

0053g

# Appendix 1

PROCESSED: 16:51:39 JUL 9, 1991

CCID: SN8Z

PROJECT: 7030

NAME: RKG

	*	TTTTT	EEEEEE	SSSSS	TTTTT	SSSSS	U	U	M	M	SSSSS
* PAIRED DATA ANALYSIS *	*	T	E	S	T	S	U	U	MM	MM	S
* SUMMARY STATISTICS *	*	T	EEE	SSSSS	T	SSSSS	U	U	M	M	SSSSS
	*	T	E	S	T	S	U	U	M	M	S
	*	T	EEEEEE	SSSSS	T	SSSSS	UUU	M	M	SSSSS	

PERIOD OF ANALYSIS: 4-1-91 TO 6-30-91

TEST TYPE(S): EMISSION DATA

FUEL ECONOMY

PAIR TYPE: EPA:MFR

ANALYZER(S): ALL

MODEL YEAR(S): ALL

DYNAMOMETER(S): ALL

FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL EVAP CLASS: EVAP AND NON EVAP

VEHICLE ADJUSTMENT: ALL VEHICLES

HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY

	FTP		HWFE	
	GAS *****	DIESEL *****	GAS *****	DIESEL *****
A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS	200	1	231	1
B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS	7	0	0	0
C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA	33	0	28	0
D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE	12	1	15	0
E. NUMBER OF VOID EPA TESTS	28	1	10	0
 TOTAL NUMBER OF EPA TESTS IN THIS PERIOD	 280	 3	 284	 1
PAIRS MADE = (A+B+C)	240	1	259	1
POSSIBLE PAIRS = (A+B+C+D)	252	2	274	1
PERCENT PAIRED: ((A+B+C)/PPAIRS)*100%	95.2	50.0	94.5	100.0
PERCENT NOT PAIRED: (D/PPAIRS)*100%	4.8	50.0	5.5	0.0
 100.0	 100.0	 100.0	 100.0	

## Appendix 2

PROCESSED: 16:51:39 JUL 9, 1991  
 PERIOD OF ANALYSIS: 4-1-91 TO 6-30-91  
 PAIR TYPE: EPA:MFR

\*\*\*\*\*  
 \* FFFFF FTTTT PPPP DDDD EEEE L  
 \* PAIRED DATA ANALYSIS \* F FFFF T PPPP D D EEE L  
 \* SUMMARY STATISTICS \* F F T P D D E E L  
 \* F T P DDDD EEEE LLLL  
 \*\*\*\*\*

COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY

SIGNED DIFFERENCES: (MFR - EPA)

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG			
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20	CHRYS	30	-0.006	0.050	30	-0.49	0.85	30	-9.9	14.6	30	-0.062	0.078	30	0.47	0.43
30	FORD	34	-0.012	0.029	34	-0.03	0.48	34	-3.8	8.9	34	-0.044	0.070	34	0.23	0.30
40	GM	47	-0.005	0.041	47	-0.27	0.53	47	5.9	9.0	47	-0.027	0.072	47	-0.00	0.38
120	BMW	1	-0.011	0.000	1	-0.02	0.00	1	-3.6	0.0	1	0.000	0.000	1	0.08	0.00
200	MBZ	6	-0.007	0.026	6	-0.14	0.29	6	3.5	10.3	6	0.010	0.011	6	-0.19	0.45
220	FERRA	1	0.060	0.000	1	0.29	0.00	1	22.2	0.0	1	-0.036	0.000	1	-0.11	0.00
251	GKAUT	2	0.005	0.025	2	0.04	0.00	2	4.0	14.0	2	0.054	0.035	2	-0.16	0.50
253	VECTO	1	0.025	0.000	1	-0.06	0.00	1	-12.9	0.0	1	0.170	0.000	1	0.15	0.00
260	HONDA	7	-0.001	0.013	7	-0.15	0.33	7	0.1	8.8	7	0.005	0.068	7	-0.05	0.54
290	ISUZU	2	0.021	0.024	2	0.34	0.05	2	7.3	5.9	2	0.060	0.031	2	-0.13	0.40
305	JCI	1	-0.021	0.000	1	0.15	0.00	1	16.9	0.0	1	-0.006	0.000	1	-0.34	0.00
380	NISSN	10	0.051	0.036	10	0.19	0.42	10	5.0	5.5	10	0.025	0.045	10	-0.14	0.40
410	PEUGT	2	0.001	0.001	2	-0.28	0.15	2	-17.1	5.3	2	-0.164	0.122	2	0.75	0.27
440	R-R	1	-0.009	0.000	1	0.23	0.00	1	-10.1	0.0	1	0.065	0.000	1	0.24	0.00
470	SAAB	14	0.058	0.041	14	0.33	0.30	14	18.9	12.0	14	-0.023	0.106	14	-0.25	0.62
490	MITSH	3	0.068	0.012	3	0.01	0.14	3	16.3	6.6	3	0.014	0.037	3	-0.56	0.43
540	SUZUK	5	0.044	0.027	5	0.71	0.11	5	13.3	2.7	5	0.024	0.064	5	-2.11	0.66
560	MZM	10	0.010	0.039	10	0.25	0.20	10	24.7	11.5	10	0.020	0.070	10	-1.09	0.38
570	TOYOT	12	0.049	0.040	12	0.37	0.36	12	8.2	12.1	12	0.032	0.087	12	-0.19	0.44
590	V W	2	0.026	0.006	2	0.29	0.02	2	-16.6	10.7	2	0.037	0.025	2	1.02	0.69
600	VOLVO	6	0.016	0.016	6	0.13	0.22	6	-4.8	3.2	6	0.051	0.054	6	0.28	0.13
614	YUGOA	1	0.008	0.000	1	0.07	0.00	1	2.6	0.0	1	0.049	0.000	1	-0.08	0.00
640	AUDI	1	-0.056	0.000	1	-0.11	0.00	1	-7.3	0.0	1	0.018	0.000	1	0.34	0.00
660	FUJI	1	0.013	0.000	1	-0.13	0.00	1	0.6	0.0	1	0.024	0.000	1	0.24	0.00
ALL		200	0.009	0.044	200	-0.06	0.57	200	2.9	14.0	200	-0.017	0.080	200	-0.02	0.63

SIGNED DIFFERENCES: (MFR - EPA)

- DIESEL ONLY -

	PARTIC																		
	*****	*****	*****																
200	MBZ	1	-0.033	0.000	1	-0.06	0.00	1	0.1	0.0	1	0.209	0.000	1	0.01	0.00	1	0.016	0.000
ALL		1	-0.033	0.000	1	-0.06	0.00	1	0.1	0.0	1	0.209	0.000	1	0.01	0.00	1	0.016	0.000

## Appendix 2-b

PROCESSED: 16:51:39 JUL 9, 1991

PERIOD OF ANALYSIS: 4-1-91 TO 6-30-91

PAIR TYPE: EPA:MFR

<pre>*****</pre>	<pre>*</pre>	<pre>FFFFF</pre>	<pre>TTTTT</pre>	<pre>PPPPP</pre>	<pre>PPP P</pre>	<pre>CCCCC</pre>	<pre>TTTTT</pre>
<pre>*****</pre>	<pre>PAIRED DATA ANALYSIS</pre>	<pre>F</pre>	<pre>T</pre>	<pre>P</pre>	<pre>P P</pre>	<pre>C</pre>	<pre>T</pre>
<pre>*****</pre>	<pre>SUMMARY STATISTICS</pre>	<pre>FFF</pre>	<pre>T</pre>	<pre>PPP P</pre>	<pre>PPP P</pre>	<pre>C</pre>	<pre>T</pre>
<pre>*****</pre>	<pre>*</pre>	<pre>F</pre>	<pre>T</pre>	<pre>P</pre>	<pre>P</pre>	<pre>C</pre>	<pre>T</pre>
<pre>*****</pre>							

COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

HC				CO				CO2				NOX				MPG			
	NUM	AVG	STDEV		NUM	AVG	STDEV		NUM	AVG	STDEV		NUM	AVG	STDEV		NUM	AVG	STDEV
20	CHRYS	30	0.0	14.8	30	-11.3	22.9	30	-1.75	2.42	30	-14.7	24.0	30	2.82	2.51			
30	FORD	34	-5.5	14.1	34	2.8	32.2	34	-0.70	1.60	34	-7.4	16.8	34	1.33	1.66			
40	GM	47	-1.1	16.3	47	-6.7	19.8	47	1.29	1.94	47	-6.0	15.4	47	-0.07	1.89			
120	BMW	1	-5.4	0.0	1	-1.2	0.0	1	-0.54	0.00	1	0.0	0.0	1	0.61	0.00			
200	MBZ	6	-10.4	18.1	6	-9.0	37.4	6	0.79	2.29	6	12.8	15.5	6	-0.98	2.27			
220	FERRA	1	42.9	0.0	1	67.4	0.0	1	2.95	0.00	1	-21.2	0.0	1	-0.94	0.00			
251	GKAUT	2	5.5	18.7	2	7.5	0.1	2	0.83	2.81	2	32.5	23.4	2	-0.90	2.84			
253	VECTO	1	14.1	0.0	1	-2.2	0.0	1	-1.21	0.00	1	26.2	0.0	1	1.82	0.00			
260	HONDA	7	0.9	10.7	7	-8.1	26.7	7	0.51	2.57	7	10.3	28.3	7	0.17	2.11			
290	ISUZU	2	9.8	11.0	2	34.3	35.4	2	1.95	1.89	2	42.1	18.8	2	-0.39	1.76			
305	JCI	1	-17.4	0.0	1	16.1	0.0	1	2.75	0.00	1	-6.1	0.0	1	-2.37	0.00			
380	NISSN	10	33.1	26.8	10	16.6	28.9	10	1.35	1.57	10	12.8	23.2	10	-0.57	1.58			
410	PEUGT	2	0.8	1.1	2	-24.5	16.4	2	-4.04	1.24	2	-61.5	38.5	2	3.63	1.31			
440	R-R	1	-6.9	0.0	1	31.1	0.0	1	-1.30	0.00	1	15.1	0.0	1	2.12	0.00			
470	SAAB	14	33.6	24.9	14	22.5	20.1	14	4.59	2.95	14	5.0	32.4	14	-1.13	2.88			
490	MITSH	3	43.1	9.7	3	1.8	9.6	3	4.34	1.91	3	11.2	21.5	3	-2.37	1.77			
540	SUZUK	5	54.5	44.8	5	109.0	29.1	5	6.17	1.29	5	35.1	41.5	5	-5.10	1.22			
560	MZM	10	7.9	28.1	10	37.0	30.8	10	6.25	1.92	10	12.5	31.3	10	-4.64	1.67			
570	TOYOT	12	30.0	21.8	12	26.7	29.5	12	1.85	2.71	12	27.7	41.3	12	-0.92	2.20			
590	V W	2	16.2	5.2	2	29.4	8.6	2	-4.29	2.82	2	43.5	30.0	2	4.53	2.96			
600	VOLVO	6	8.4	7.1	6	8.7	15.8	6	-1.13	0.71	6	28.7	32.9	6	1.38	0.65			
614	YUGOA	1	3.9	0.0	1	5.7	0.0	1	0.76	0.00	1	25.1	0.0	1	-0.31	0.00			
640	AUDI	1	-20.4	0.0	1	-6.3	0.0	1	-1.54	0.00	1	19.6	0.0	1	1.84	0.00			
660	FUJI	1	10.4	0.0	1	-8.3	0.0	1	0.14	0.00	1	7.4	0.0	1	1.18	0.00			
ALL		200	7.4	24.2	200	6.5	33.1	200	0.91	3.09	200	2.0	28.4	200	0.18	2.77			

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- DIESEL ONLY -

PARTIC																			
200	MBZ	1	-23.4	0.0	1	-6.0	0.0	1	0.03	0.00	1	26.8	0.0	1	0.03	0.00	1	9.0	0.0
ALL		1	-23.4	0.0	1	-6.0	0.0	1	0.03	0.00	1	26.8	0.0	1	0.03	0.00	1	9.0	0.0

Appendix 3

PROCESSED: 16:51:41 JUL 9, 1991 \* PAIRED DATA ANALYSIS  
 PERIOD OF ANALYSIS: 4- 1-91 TO 6-30-91 \* SUMMARY STATISTICS  
 PAIR TYPE: EPA:MFR \* \*

卷之三

**SIGNED DIFFERENCES:** (MFR - EPA)

- GASOLINE ONLY -

SIGNED DATED: (M/R - EFA) \*

= DIESEL ONLY =

SOURCED DIFFERENCES: (MPR - EPA)				- DIESEL ONLY -		
*****				*****		
2000 MBZ	1	-0.002	0.000	1	0.00	0.00
ALL	1	-0.002	0.000	1	0.00	0.00

### Appendix 3-b

PROCESSED: 16:51:41 JUL 9, 1991  
 PERIOD OF ANALYSIS: 4-1-91 TO 6-30-91  
 PAIR TYPE: EPA:MFR

\*\*\*\*\*  
 \* PAIRED DATA ANALYSIS \* H H W W F FFFF EEEEE PPPP CCCCC TTTTT  
 \* SUMMARY STATISTICS \* HHHHH W W W FFF EEE PPPPP CCCCC TTTTT  
 \* H H WW WW F E P CCCCC T  
 \*\*\*\*\*

COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV									
20 CHRYS	35	4.7	38.8	35	43.0	97.6	35	0.25	2.13	35	-22.2	34.9	35	0.64	2.10
30 FORD	41	5.3	61.6	41	66.8	236.0	41	-0.40	1.88	41	-12.9	30.1	41	1.00	1.91
40 GM	55	15.9	49.8	55	88.8	174.9	55	0.96	2.21	55	-24.8	47.9	55	0.12	2.21
120 BMW	1	-77.2	0.0	1	-38.6	0.0	1	1.28	0.00	1	11.1	0.0	1	-1.32	0.00
200 MBZ	6	-22.6	18.8	6	-11.9	20.9	6	-0.39	1.42	6	49.5	115.1	6	0.42	1.50
220 FERRA	1	0.0	0.0	1	600.0	0.0	1	4.70	0.00	1	20.0	0.0	1	-2.70	0.00
251 GKAUT	2	191.9	222.1	2	448.3	520.9	2	2.07	4.06	2	369.6	422.4	2	-2.10	4.09
253 VECTO	1	-41.5	0.0	1	261.9	0.0	1	-0.89	0.00	1	31.2	0.0	1	1.39	0.00
260 HONDA	5	25.5	52.8	5	35.7	72.6	5	1.99	2.60	5	-12.8	36.9	5	-1.18	2.10
290 ISUZU	3	30.7	42.3	3	38.6	140.7	3	-1.58	1.74	3	500.6	350.7	3	2.97	1.58
305 JCI	1	200.0	0.0	1	0.0	0.0	1	0.23	0.00	1	-93.8	0.0	1	0.23	0.00
347 LIPHT	1	16.7	0.0	1	-54.5	0.0	1	12.58	0.00	1	62.5	0.0	1	-10.85	0.00
380 NISSN	12	85.0	145.5	12	48.4	73.0	12	2.16	1.97	12	23.9	93.1	12	-1.45	1.89
410 PEUGT	2	16.7	23.6	2	-8.7	15.4	2	-3.01	0.61	2	6.3	86.6	2	2.54	0.57
440 R-R	1	-22.7	0.0	1	-4.8	0.0	1	3.94	0.00	1	-15.4	0.0	1	-3.11	0.00
470 SAAB	15	35.8	79.5	15	82.2	162.9	15	1.75	2.19	15	14.7	34.8	15	1.58	2.22
490 MITSH	4	61.6	11.3	4	146.4	115.8	4	3.59	1.79	4	52.7	73.6	4	-2.01	1.56
540 SUZUK	8	63.4	228.7	8	191.9	302.7	8	6.48	4.51	8	472.9	375.7	8	-4.76	3.70
560 MZM	10	77.1	172.0	10	302.9	419.3	10	4.77	2.67	10	354.4	384.6	10	-3.22	2.48
570 TOYOT	13	39.4	139.7	13	28.3	239.4	13	1.19	2.77	13	186.4	328.4	13	-0.04	2.47
590 V W	5	34.4	81.7	5	60.8	105.0	5	-0.17	1.31	5	91.7	173.0	5	0.56	1.18
600 VOLVO	6	-15.6	17.6	6	60.6	106.7	6	-0.86	1.79	6	-9.3	30.3	6	1.16	1.84
614 YUGOA	1	-1.7	0.0	1	-7.3	0.0	1	1.07	0.00	1	130.8	0.0	1	-0.33	0.00
640 AUDI	1	-12.5	0.0	1	-21.5	0.0	1	0.43	0.00	1	-28.6	0.0	1	0.29	0.00
660 FUJI	1	31.7	0.0	1	-14.0	0.0	1	-3.29	0.00	1	93.5	0.0	1	4.88	0.00
ALL	231	23.9	90.3	231	82.0	203.0	231	1.05	2.85	231	47.2	195.1	231	0.01	2.66

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- DIESEL ONLY -

	200 MBZ	1	-2.9	0.0	1	0.0	0.0	1	-2.20	0.00	1	25.8	0.0	1	2.44	0.00
ALL	1	-2.9	0.0	1	0.0	0.0	1	-2.20	0.00	1	25.8	0.0	1	2.44	0.00	



## Appendix 5

PROCESSED: 16:51:42 JUL 9, 1991  
 PERIOD OF ANALYSIS: 4-1-91 TO 6-30-91  
 PAIR TYPE: EPA:MFR

\*\*\*\*\*  
 \* RRRR .000 AAA DDDDD L 000 AAA DDDDD  
 \* R R 0 0 A A D D D L 0 0 A A D D D  
 \* RRRR 0 0 AAAAA D D D L 0 0 AAAAA D D D  
 \* R R 0 0 A A D D D L 0 0 A A D D D  
 \* R R 000 A A DDDDD LLLL 000 A A DDDDD  
 \*\*\*\*\*

COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY

### COASTDOWN DATA:

MFR TRK			MFR QCHK			EPA QCHK			(MFR-EPA)			((M-E)/E)%			VFHP (M-E)			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	
20 CHRYS	35	12.56	4.86	35	12.45	4.82	35	12.45	4.80	35	-0.01	0.30	35	-0.10	2.11	35	0.05	0.41
30 FORD	41	14.65	2.91	41	14.44	2.85	41	14.37	2.98	41	0.07	0.76	41	0.95	7.74	41	-0.25	1.83
40 GM	55	15.66	1.79	55	15.89	1.70	55	15.69	1.82	55	0.20	0.66	55	1.54	5.11	55	-0.27	0.87
120 BMW	1	17.46	0.00	1	18.47	0.00	1	18.20	0.00	1	0.27	0.00	1	1.48	0.00	1	-0.20	0.00
200 MBZ	6	17.69	1.98	6	17.42	1.49	6	16.91	2.44	6	0.51	1.47	6	4.09	11.07	6	-0.62	1.63
220 FERRA	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00
251 GKAUT	2	0.00	0.00	2	0.00	0.00	2	0.00	0.00	2	0.00	0.00	2	0.00	0.00	2	0.00	0.00
253 VECTO	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00
260 HONDA	5	16.35	0.80	5	16.06	0.94	5	15.84	0.67	5	0.22	0.63	5	1.37	3.88	5	-0.13	0.41
290 ISUZU	3	11.63	0.83	3	11.83	1.12	3	11.47	0.64	3	0.37	0.55	3	3.07	4.55	3	-0.43	0.59
305 JCI	1	17.50	0.00	1	18.44	0.00	1	18.47	0.00	1	-0.03	0.00	1	-0.16	0.00	1	0.02	0.00
347 LIPHT	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00
380 NISSAN	12	14.23	0.86	12	14.02	0.97	12	14.17	1.11	12	-0.15	0.51	12	-0.91	3.53	12	0.14	0.51
410 PEUGT	2	13.16	0.74	2	13.11	0.63	2	13.36	0.88	2	-0.24	0.25	2	-1.78	1.74	2	0.26	0.25
440 R-R	1	14.77	0.00	1	14.62	0.00	1	14.75	0.00	1	-0.13	0.00	1	-0.88	0.00	1	0.20	0.00
470 SAAB	15	15.01	0.91	15	14.46	1.39	15	14.69	1.27	15	-0.23	0.42	15	-1.64	3.05	15	0.25	0.45
490 MITSH	4	14.53	0.90	4	14.43	0.83	4	14.35	0.62	4	0.08	0.47	4	0.54	3.15	4	-0.07	0.42
540 SUZUK	8	13.44	0.55	8	13.42	0.57	8	13.20	0.66	8	0.21	0.54	8	1.72	4.13	8	-0.17	0.41
560 MZM	10	15.84	1.57	10	15.78	1.46	10	15.91	1.87	10	-0.13	0.48	10	-0.56	2.86	10	0.05	0.35
570 TOYOT	13	14.39	1.20	13	13.99	1.02	13	14.27	1.18	13	-0.28	0.90	13	-1.75	5.91	13	0.30	0.98
590 V W	5	17.79	1.21	5	16.78	1.09	5	17.60	1.08	5	-0.82	0.41	5	-4.66	2.23	5	0.56	0.29
600 VOLVO	6	15.38	0.66	6	15.89	0.81	6	16.05	0.93	6	-0.15	0.22	6	-0.92	1.38	6	0.12	0.19
614 YUGOA	1	11.93	0.00	1	11.93	0.00	1	10.55	0.00	1	1.38	0.00	1	13.08	0.00	1	-1.58	0.00
640 AUDI	1	18.41	0.00	1	15.66	0.00	1	17.67	0.00	1	-2.01	0.00	1	-11.38	0.00	1	1.65	0.00
660 FUJI	1	13.96	0.00	1	13.36	0.00	1	13.71	0.00	1	-0.35	0.00	1	-2.55	0.00	1	0.41	0.00
ALL	231	14.43	3.55	231	14.33	3.53	231	14.31	3.58	231	0.02	0.66	231	0.35	5.29	231	-0.07	1.01

### COASTDOWN DATA:

- DIESEL TESTS -																		
200 MBZ	1	16.62	0.00	1	16.86	0.00	1	16.95	0.00	1	-0.09	0.00	1	-0.53	0.00	1	0.07	0.00
ALL	1	16.62	0.00	1	16.86	0.00	1	16.95	0.00	1	-0.09	0.00	1	-0.53	0.00	1	0.07	0.00

## Appendix 6

COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY										- ALL FUELS -											
SIGNED DIFFERENCES: ( MFR - EPA )										MFR GROUP											
*****										*****											
*****										*****											
TP	SITE	HC	CO	CO2	NOX	MPG	AMC	CHR	FRD	GM	OTHR	TP	SITE	HC	CO	CO2	NOX	MPG	COUNT BY MFR GROUP		
		NUM	Avg	STDEV	NUM	Avg	STDEV	NUM	Avg	STDEV	TP		NUM	Avg	STDEV	NUM	Avg	STDEV	TP		
FTP	D001	43	0.006	0.040	43	-0.07	0.55	43	0.79	14.26	43	-0.006	0.080	43	0.03	0.55	0	3	13	9	18
	D002	35	0.010	0.047	35	-0.04	0.49	35	0.71	12.07	35	-0.012	0.072	35	0.10	0.56	0	3	4	11	17
	D003	44	0.019	0.045	44	0.15	0.48	44	8.50	13.05	44	-0.006	0.064	44	-0.32	0.81	0	3	6	11	24
	D004	38	0.005	0.052	38	-0.10	0.62	38	4.30	16.95	38	-0.039	0.095	38	-0.08	0.59	0	7	6	7	18
	D005	16	-0.005	0.037	16	-0.29	0.74	16	-1.22	11.29	16	-0.035	0.066	16	-0.34	0.57	0	5	2	5	4
	D006	24	0.009	0.031	24	-0.21	0.61	24	0.05	11.73	24	-0.012	0.096	24	0.08	0.40	0	9	3	4	8
	D007	1	-0.033	0.000	1	-0.06	0.00	1	0.10	0.00	1	0.209	0.000	1	0.01	0.00	0	0	0	0	1
ALL	201	0.009	0.044	201	-0.06	0.57	201	2.88	13.93	201	-0.015	0.081	201	-0.02	0.63	0	30	34	47	90	
A001	78	0.008	0.043	78	-0.06	0.52	78	0.76	13.24	78	-0.009	0.076	78	0.06	0.55	0	6	17	20	35	
A002	82	0.013	0.049	82	0.04	0.56	82	6.55	15.03	82	-0.022	0.081	82	-0.21	0.72	0	10	12	18	42	
A003	40	0.004	0.034	40	-0.24	0.66	40	-0.46	11.43	40	-0.021	0.085	40	0.18	0.48	0	14	5	9	12	
A004	1	-0.033	0.000	1	-0.06	0.00	1	0.10	0.00	1	0.209	0.000	1	0.01	0.00	0	0	0	0	1	
ALL	201	0.009	0.044	201	-0.06	0.57	201	2.88	13.93	201	-0.015	0.081	201	-0.02	0.63	0	30	34	47	90	
HWFE	D001	41	-0.005	0.019	41	0.02	0.14	41	-2.99	7.20	41	-0.036	0.180	41	0.45	0.65	0	3	12	9	17
	D002	37	0.003	0.019	37	0.06	0.24	37	1.92	10.83	37	-0.005	0.111	37	-0.05	0.96	0	3	8	10	16
	D003	58	0.006	0.035	58	0.07	0.28	58	5.19	7.12	58	0.008	0.142	58	-0.39	1.17	0	7	8	13	30
	D004	42	0.005	0.029	42	0.03	0.32	42	2.67	7.27	42	-0.019	0.104	42	-0.20	1.22	0	7	4	9	22
	D005	20	0.012	0.027	20	0.07	0.15	20	0.60	4.98	20	-0.018	0.108	20	0.13	0.47	0	4	3	6	7
	D006	31	0.008	0.022	31	0.09	0.37	31	5.21	8.11	31	0.001	0.106	31	-0.28	0.74	0	9	6	8	8
	D007	3	0.004	0.007	3	0.19	0.26	3	6.50	10.48	3	0.012	0.097	3	0.13	0.73	0	2	0	0	1
ALL	232	0.004	0.027	232	0.06	0.26	232	2.39	8.33	232	-0.010	0.131	232	-0.09	1.00	0	35	41	55	101	
A001	78	-0.002	0.019	78	0.04	0.20	78	-0.66	9.37	78	-0.021	0.152	78	0.21	0.85	0	6	20	19	33	
A002	100	0.006	0.032	100	0.05	0.29	100	4.13	7.26	100	-0.003	0.127	100	-0.31	1.19	0	14	12	22	52	
A003	51	0.009	0.024	51	0.08	0.30	51	3.40	7.35	51	-0.006	0.103	51	-0.12	0.67	0	13	9	14	15	
A004	3	0.004	0.007	3	0.19	0.26	3	6.50	10.48	3	0.012	0.097	3	0.13	0.73	0	2	0	0	1	
ALL	232	0.004	0.027	232	0.06	0.26	232	2.39	8.33	232	-0.010	0.131	232	-0.09	1.00	0	35	41	55	101	

## Appendix 6-b

PROCESSED:	16:51:40	JUL	9,	1991	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
PERIOD OF ANALYSIS:	4-	1-91	TO	6-30-91	*	PAIRED DATA ANALYSIS	*	PPPPP	CCCCC	TTTTT	SSSSS	III	TTTTT	EEEEEE	
PAIR TYPE:	EPA:MFR	*	SUMMARY STATISTICS	*	P	PPP P	C	T	S	T	SSSSS	I	T	E	
COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY	*	*****	*****	*****	P	P	C	T	S	T	S	I	T	EEEEEE	
PERCENT DIFFERENCES: ((MFR - EPA)/EPA) x 100%	*	*****	*****	*****	*	*****	*****	*****	*****	*****	*****	*****	*****	*****	
					- ALL FUELS -										
TP	SITE	HC	CO	CO2	NOX	MPG	COUNT BY MFR GROUP								
FTP		NUM	AVG	STDEV	NUM	Avg	STDEV	NUM	Avg	STDEV	AMC	CHR	FRD	GM OTHR	
D001	43	4.7	21.5	43	6.2	35.2	43	0.53	2.95	43	4.8	27.2	43	0.52	
D002	35	10.4	31.8	35	5.8	36.7	35	0.38	2.69	35	-0.3	28.3	35	0.70	
D003	44	13.4	24.6	44	18.2	31.0	44	2.26	3.20	44	6.8	26.4	44	-1.05	
D004	38	6.9	24.8	38	4.4	30.4	38	1.34	3.65	38	-1.2	29.5	38	-0.05	
D005	16	-1.2	17.0	16	-0.9	38.9	16	-0.48	2.52	16	-3.6	31.3	16	1.45	
D006	24	3.7	16.3	24	-5.0	22.5	24	0.16	2.25	24	0.1	31.2	24	0.58	
D007	1	-23.4	0.0	1	-6.0	0.0	1	0.03	0.0	1	26.8	0.0	1	0.03	
ALL	201	7.3	24.2	201	6.4	33.0	201	0.91	3.09	201	2.1	28.3	201	0.18	
A001	78	7.2	26.6	78	6.0	35.6	78	0.46	2.82	78	2.5	27.6	78	-0.60	
A002	82	10.4	24.8	82	11.8	31.3	82	1.84	3.43	82	3.1	28.0	82	-0.58	
A003	40	1.8	16.5	40	-3.3	29.7	40	-0.10	2.35	40	-1.4	30.9	40	0.93	
A004	1	-23.4	0.0	1	-6.0	0.0	1	0.03	0.0	1	26.8	0.0	1	0.03	
HWFE	ALL	201	7.3	24.2	201	6.4	33.0	201	0.91	3.09	201	2.1	28.3	201	0.18
D001	41	13.2	97.6	41	95.8	244.1	41	-0.73	2.20	41	65.7	239.1	41	1.69	
D002	37	33.9	123.8	37	106.2	225.1	37	0.80	3.20	37	31.7	146.0	37	0.10	
D003	58	26.9	89.6	58	99.1	220.7	58	2.13	2.92	58	79.4	255.7	58	-0.83	
D004	42	14.4	45.6	42	48.6	158.1	42	1.39	3.08	42	143.7	143.0	42	-0.09	
D005	20	36.2	69.8	20	86.8	149.1	20	0.27	1.58	20	39.1	166.8	20	0.48	
D006	31	26.2	98.7	31	44.4	173.1	31	1.60	2.30	31	8.7	123.8	31	-0.82	
D007	3	5.7	7.4	3	64.3	77.3	3	0.98	2.75	3	-6.1	28.0	3	-0.28	
ALL	232	23.8	90.2	232	81.7	202.6	232	1.03	2.85	232	47.1	194.7	232	0.02	
A001	78	23.0	110.6	78	100.7	233.8	78	-0.00	2.81	78	49.6	199.9	78	0.94	
A002	100	21.7	74.3	100	77.9	197.5	100	1.82	2.99	100	60.2	215.9	100	-0.52	
A003	51	30.2	87.8	51	61.0	163.9	51	1.08	2.14	51	20.6	141.4	51	-0.31	
A004	3	5.7	7.4	3	64.3	77.3	3	0.98	2.75	3	-6.1	28.0	3	-0.28	
ALL	232	23.8	90.2	232	81.7	202.6	232	1.03	2.85	232	47.1	194.7	232	0.02	

## Appendix 7

PROCESSED:	16:51:39	JUL	9,	1991	*	PAIRIED DATA ANALYSIS	*	FFFFF	TTTTT	PPPPP	RRRRR	FFFFFF	CCCCC
PERIOD OF ANALYSIS:	4- 1-91 TO	6-30-91	*	SUMMARY STATISTICS	*	F FFFF	T T	P PPP	R RRR	R R	F FFF	C C	
PAIR TYPE:	EPA:MFR	*	*	*	*	F F	T T	P P	R R	R R	F F	C C	
COMMENTS: 3 MO PD ENDING JUNE 91, LAST ONLY 2ND TRY													
***** PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %													
***** RANDOM AUDIT													
***** FAILURE AT MFR													
***** MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE													
***** FE UP BY 1 OR MORE													
***** NEW VEHICLE													
***** FE CORR OFFSET													
***** ALL OTHERS													
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG
20	CHRYSL	15	3.20	2.26	2	-1.16	0.70	7	3.35	2.74	0	0.00	0.00
30	FORD	19	1.26	1.66	0	0.00	0.00	4	1.45	2.49	0	0.00	0.00
40	GM	11	-0.72	2.07	1	0.85	0.00	7	0.66	1.37	1	-0.66	0.00
120	BMW	1	0.00	0.00	0	0.00	0.00	1	0.61	0.00	0	0.00	0.00
200	MBZ	1	0.32	0.00	0	0.00	0.00	0	0.00	0.00	1	-1.01	0.00
220	FERRA	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	-0.94	0.00
251	GKAUT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
253	VECTO	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	-0.90	2.84
260	HONDA	1	-1.30	0.00	0	0.00	0.00	0	0.00	0.00	1	1.82	0.00
290	ISUZU	2	-0.39	1.76	0	0.00	0.00	0	0.00	0.00	4	-1.25	0.93
305	JCI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
380	NISSN	8	-0.58	1.74	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
410	PEUGT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
440	R-R	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	2.12	0.00
470	SAAB	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
490	MITSH	3	-2.37	1.77	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
540	SUZUK	4	-4.87	1.28	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
560	MZM	2	-5.53	1.09	0	0.00	0.00	0	0.00	0.00	4	-3.39	1.49
570	TOYOT	8	-2.09	1.09	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
590	V W	2	4.53	2.96	0	0.00	0.00	0	0.00	0.00	14	-1.13	2.88
600	VOLVO	5	1.19	0.51	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
614	YUGOA	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	-6.02	0.00
640	AUDI	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	1.41	2.03
660	FUJI	1	1.18	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
ALL		82	0.27	2.86	3	-0.49	1.26	19	1.81	2.39	19	-0.51	2.47
***** PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %													
200	MBZ	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
ALL	0	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
ANN ARBOR, MICHIGAN 48105

MER  
A. 91-46  
IV-B-2

July 16, 1991

OFFICE OF  
AIR AND RADIATION

MEMORANDUM

SUBJECT: Monthly Paired Data - May 1991

FROM: Robert K. Gilkey, Engineer  
Correlation & Engineering Services

TO: Eldert Bontekoe, Team Leader  
Certification Branch

THRU: Martin Reineman, Manager  
Correlation and Engineering Services

*R. K. Gilkey*  
*L. Haskett for MER*

This report presents the paired data for May 1991. Attachment A presents the Monthly Paired Data Status Graphs, while Attachment B presents paired differences of fuel economy and quickcheck coastdown times between EPA and selected individual manufacturers. Attachment C details the methods used to prepare the graphs and summaries used for this analysis. The paired data summary statistics are presented in the Appendix.

Conclusions:

1. Overall FTP and HFET fuel economy percent differences continue near zero and FTP emission offsets continue to be acceptable.
2. Ford showed a +1.8% May FTP fuel economy difference. This drove their three month average to +1.8%. Their May HFET fuel economy showed a +1.4% deviation. This drove their three month average to +1.1%. Both values continue Ford's positive trend which has run for over seven months.
3. Chrysler showed a pronounced May offset of +3.3% in FTP fuel economy. Their three month average is now +2.6%. This offset is not reflected in the HFET results. The offset is evident in data from vehicles tested at either the Chrysler Plymouth Road facility or the Chrysler Chelsea Proving Ground data.

Discussion:

Overall Results:

Attachment A shows acceptable overall FTP emission running averages.

-2-

Both the FTP and HFET MPG running averages remain near zero and are acceptable.

Selected Manufacturers Results:

Attachment B shows that Ford and Chrysler maintained their positive FTP fuel economy biases.

Ford's three month average FTP fuel economy difference is +1.8%. This is statistically different than EPA when using a paired t-test at the 95% confidence level. Fuel economy data is calculated after excluding "FE UP BY 1 OR MORE" tests for this comparison. An eight month positive HFET fuel economy trend also continued -- though its magnitude (+1.1%) for the last three months is smaller. Preliminary second quarter MVMA correlation test data does not support the Ford offset. Ford showed a negative (-2%) FTP carbon balance fuel economy (CBFE) and zero HFET CBFE offset with a small front wheel drive sedan.

A special correlation test series started the week of June 10. Possible causes being investigated include vehicle restraint systems, and fuel differences. Preliminary results with a Ranger pick-up truck support the positive fuel economy offsets but do not yet suggest a cause. The FTP CBFE offset is about +1.4%, but the HFET CBFE offset is about +2.5%. At this point neither the restraint system or the fuel appear to contribute heavily to the offset.

Chrysler fuel economy correlation changed considerably in May forcing their three month FTP average to +2.6%. Again, this difference is based on excluded "FE UP BY 1 OR MORE"s, three months of data, and statistical significance at the 95% confidence level. They did not show the same magnitude change for HFET fuel economy. The Plymouth Road facility has the smaller May deviation from EPA compared to the Chelsea proving Ground facility (+2.5% for five tests versus +3.9% for six tests). It is interesting that Chrysler had an unusually high percentage of trucks and vans (70%) during the month. FTP rear wheel drive vehicles average over +3.4% versus +2.2% for front wheel drives. The HFET tests show rear wheel drives averaging +0.3% versus front wheel drives at +0.0%.

The MVMA data support the direction, but not the magnitude of the Chrysler offset with positive FTP CBFEs from both of their two Proving Ground test sets (0.8% and +0.2%) and from their Plymouth Road set (+1.4%).

No other significant trends or deviations are evident and, excepting the above, the deviations in Attachment B are acceptable.

-3-

Paired Data Summary Statistics:

The following test data was excluded from the summary statistics calculations in the Appendix:

May Paired Data Rejected for Exceeding Screening Limits

<u>Mfr</u>	<u>Vehicle ID</u>	<u>VI</u>	<u>Parameter</u>	<u>Screening Limit</u>	<u>Test Result</u>	<u>EPA Value</u>
Toyota	92-SXV1	0	%CO	+160%	+167%	0.610

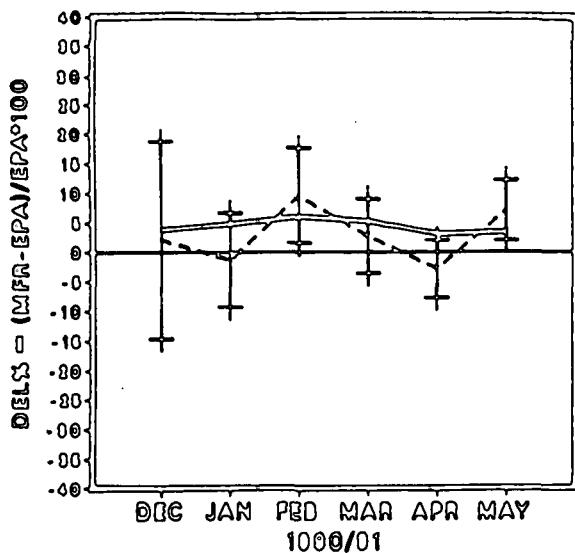
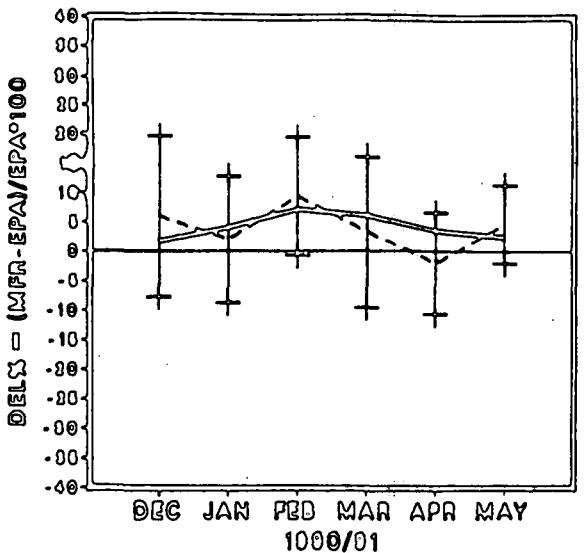
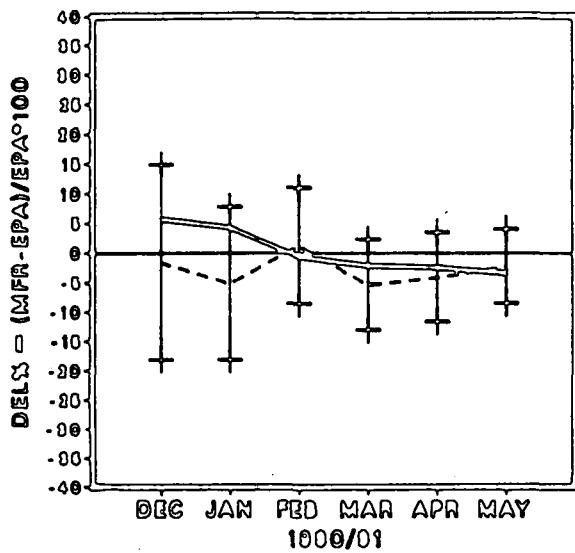
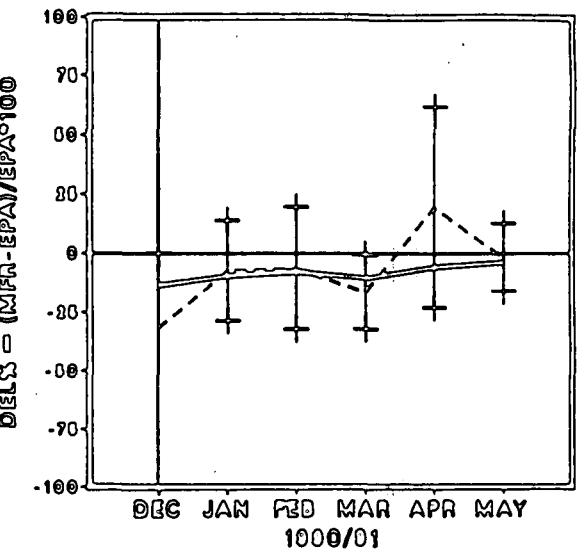
If I can be of further assistance, please call on x397.

Attachments

cc: R. Lawrence  
J.T. White  
J. Carpenter  
P. Reece  
D. Danyko  
D. Perkins  
T. Schrot  
M. Caldwell

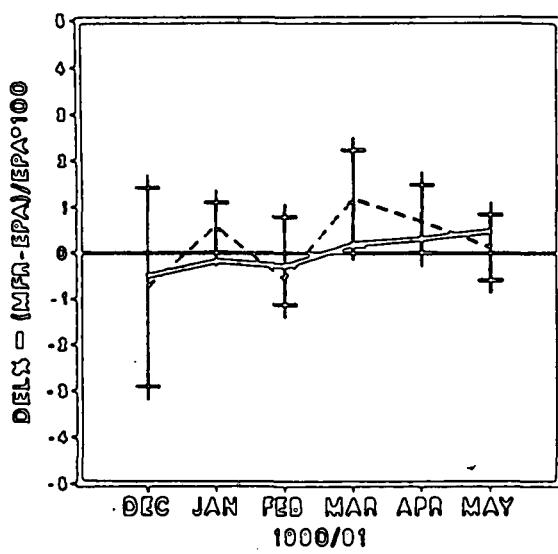
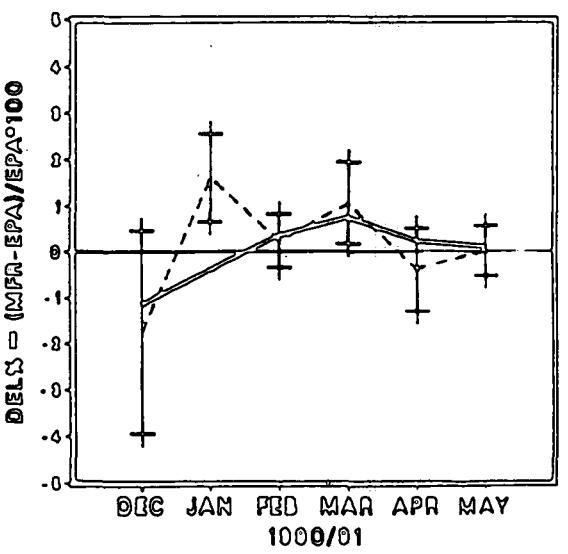
0192g

**ATTACHMENT A**  
**Engineering Operations Division**  
**Monthly Paired Data Status Graphs**

**FTP HC****FTP CO****FTP NOX****EVAPORATIVE EMISSIONS**

**Legend**

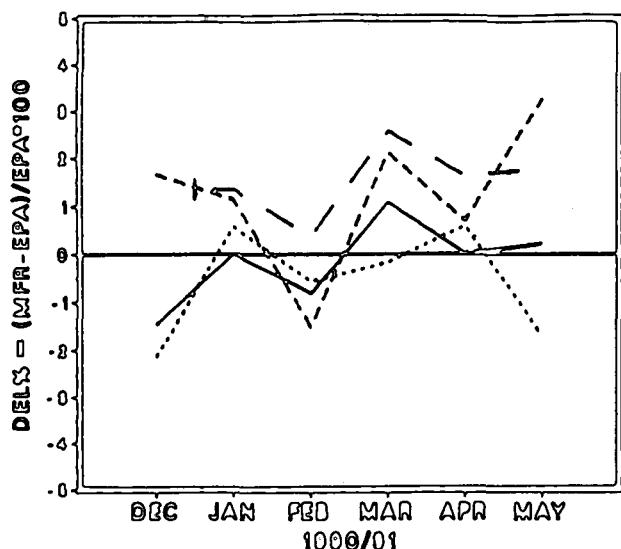
- MONTHLY MEAN —
- RUNNING AVERAGE —
- Confidence Interval

**FTP MPG****HFET MPG**

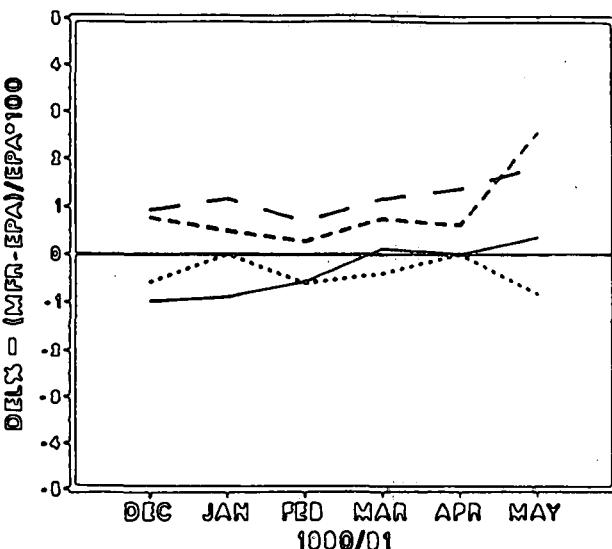
## ATTACHMENT B

Engineering Operations Division  
Manufacturer Product Data Status Graphs

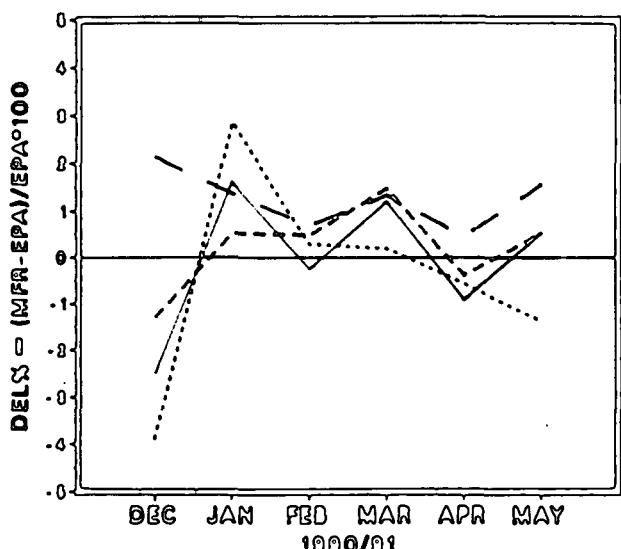
**FTP MPG**  
MONTHLY MEANS



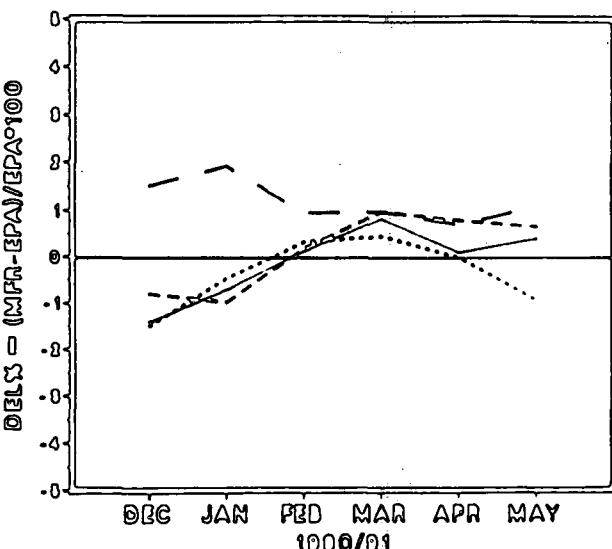
**FTP MPG**  
THREE MONTH RUNNING AVERAGE



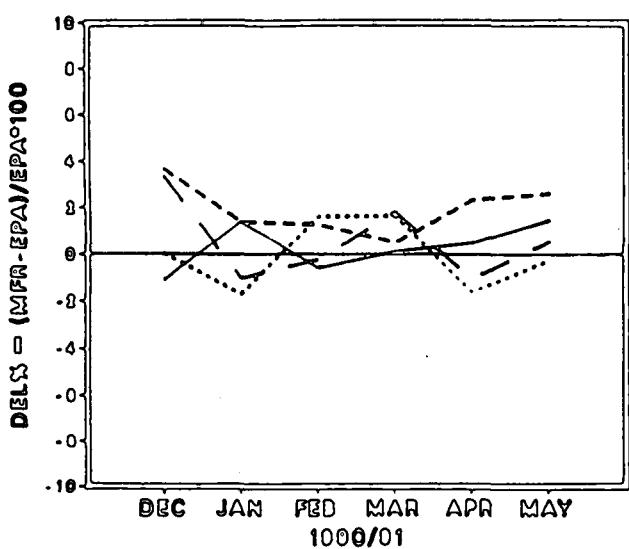
**HFET MPG**  
MONTHLY MEANS



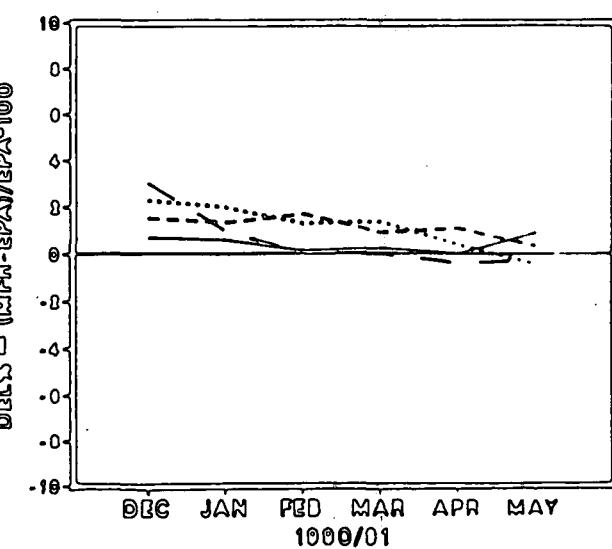
**HFET MPG**  
THREE MONTH RUNNING AVERAGE



**QUICKCHECK COASTDOWN**  
MONTHLY MEANS



**QUICKCHECK COASTDOWN**  
THREE MONTH RUNNING AVERAGE



## Legend

- GM
- PWD
- GMV
- Other

ATTACHMENT C

Engineering Operations Division  
Data Presentation Methodology

**Graph Preparation:**

Attachment A emission status graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE up by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

**Summary Statistics Preparation:**

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

Paired Data Rejection Criteria

	<u>FTP</u>					
	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg	Evap g
Upper	0.75	6.0	65.0	0.75	3.2	
Lower	-0.75	-6.0	-65.0	-0.75	-3.2	

FTP (% Difference)

Upper	135.0	160.0	15.0	100.0	15.0	*
Lower	-99.0	-99.0	-15.0	-99.0	-15.0	*

-2-

HFET

	HC g/mi	CO g/mi	CO <sub>2</sub> g/mi	NOx g/mi	FE mpg	CDT sec
Upper	0.2	6.0	45.0	1.0	4.5	
Lower	-0.2	-6.0	-45.0	-1.0	-4.5	

HFET (% Difference)

Upper		15.0	15%
Lower		-15.0	-15%

\* Values to be set in revised paired data program currently under development.

0053q

**Appendix 1**

PROCESSED: 07:14:01 JUN 6, 1991

CCID: SN8Z

PROJECT: 7030

NAME: RKG

*	*	TTTTT	EEEEEE	SSSSS	TTTTT	SSSSS	U	U	M	M	SSSSS
*	*	T	E	S	T	S	U	U	MM	MM	S
*	*	T	EEE	SSSSS	T	SSSSS	U	U	M	M	SSSSS
*	*	T	E	S	T	S	U	U	M	M	S
*	*	T	EEEEEE	SSSSS	T	SSSSS	UUU	M	M	M	SSSSS

PERIOD OF ANALYSIS: 5-1-91 TO 5-31-91

TEST TYPE(S): EMISSION DATA FUEL ECONOMY

PAIR TYPE: EPA:MFR

ANALYZER(S): ALL

MODEL YEAR(S): ALL

DYNAMOMETER(S): ALL

FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL EVAP CLASS: EVAP AND NON EVAP

VEHICLE ADJUSTMENT: ALL VEHICLES HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

COMMENTS: MAY PAIRED DATA--LAST ONLY

	FTP		HWFE	
	GAS *****	DIESEL *****	GAS *****	DIESEL *****
A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS	77	0	95	0
B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS	1	0	0	0
C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA	11	0	8	0
D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE	3	0	2	0
E. NUMBER OF VOID EPA TESTS	15	0	4	0
 TOTAL NUMBER OF EPA TESTS IN THIS PERIOD	 107	 0	 109	 0
PAIRS MADE = (A+B+C)	89	0	103	0
POSSIBLE PAIRS = (A+B+C+D)	92	0	105	0
PERCENT PAIRED: ((A+B+C)/PPAIRS)*100%	96.7	0.0	98.1	0.0
PERCENT NOT PAIRED: (D/PPAIRS)*100%	3.3	0.0	1.9	0.0
	100.0	0.0	100.0	0.0

**Appendix 2**

PROCESSED: 07:14:01 JUN 6, 1991  
 PERIOD OF ANALYSIS: 5-1-91 TO 5-31-91  
 PAIR TYPE: EPA:MFR

\*\*\*\* PAIRED DATA ANALYSIS \*\*\*\*  
 \*\*\*\* SUMMARY STATISTICS \*\*\*\*

FFFFF FTTTT PPPPP DDDDD EEEEE L  
 FFFF T PPPP D D EEE L  
 F T P D D E L  
 F T P D D E L  
 EEEE LLLL

COMMENTS: MAY PAIRED DATA--LAST ONLY

SIGNED DIFFERENCES: (MFR - EPA)

- GASOLINE ONLY -

	HC			CO			CO2			NOX			MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20 CHRYS	17	-0.011	0.047	17	-0.43	0.70	17	-11.7	12.8	17	-0.071	0.074	17	0.53	0.41
30 FORD	11	-0.001	0.016	11	0.01	0.24	11	-5.8	6.3	11	-0.059	0.061	11	0.25	0.19
40 GM	22	-0.005	0.040	22	-0.28	0.57	22	-4.6	8.6	22	-0.040	0.086	22	0.09	0.35
220 FERRA	1	0.060	0.000	1	0.29	0.00	1	22.2	0.0	1	-0.036	0.000	1	-0.11	0.00
290 ISUZU	2	0.021	0.024	2	0.34	0.05	2	7.3	5.9	2	0.060	0.031	2	-0.13	0.40
380 NISSN	6	0.066	0.030	6	0.40	0.33	6	5.1	4.1	6	0.021	0.042	6	-0.14	0.20
410 PEUGT	2	0.001	0.001	2	-0.28	0.15	2	-17.1	5.3	2	-0.164	0.122	2	0.75	0.27
490 MITSH	3	0.067	0.012	3	0.03	0.17	3	14.9	4.4	3	0.026	0.019	3	-0.47	0.31
560 MZM	10	0.010	0.039	10	0.25	0.20	10	24.7	11.5	10	0.020	0.070	10	-1.09	0.38
600 VOLVO	3	0.022	0.021	3	0.09	0.14	3	-6.8	2.5	3	0.082	0.066	3	0.35	0.10
ALL	77	0.007	0.042	77	-0.10	0.54	77	1.9	15.0	77	-0.030	0.084	77	0.04	0.60

**Appendix 2-b**

PROCESSED: 07:14:01 JUN 6, 1991  
 PERIOD OF ANALYSIS: 5- 1-91 TO 5-31-91  
 PAIR TYPE: EPA:MFR

COMMENTS: MAY PAIRED DATA--LAST ONLY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- GASOLINE ONLY -

	HC		CO		CO <sub>2</sub>		NOX		MPG		
	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	
20 CHRYS	17	-2.3	15.5	17	-12.7	22.1	17	-2.03	2.17	-17.4	17
30 FORD	11	-0.5	10.6	11	0.0	17.6	11	-1.07	1.12	9.4	11
40 GM	22	0.2	16.5	22	-4.7	24.0	22	0.92	1.79	5.5	22
220 FERRA	1	42.9	0.0	1	67.4	0.0	1	2.95	0.00	18.3	0.34
290 ISUZU	2	9.8	11.0	2	34.3	35.4	2	1.95	1.89	1.80	1.80
380 NISSN	6	46.2	24.2	6	31.0	23.7	6	1.28	0.99	14.1	14.1
410 PEUGT	2	0.8	1.1	2	-24.5	16.4	2	-4.04	1.24	-61.5	38.5
490 MITSH	3	42.5	10.1	3	4.0	12.5	3	3.93	1.29	15.1	16.8
560 MZM	10	7.9	28.1	10	37.0	30.8	10	6.25	1.92	12.5	31.3
600 VOLVO	3	11.3	9.1	3	7.9	11.5	3	-1.52	0.57	10	41.5
ALL	77	7.0	22.6	77	4.7	29.4	77	0.65	3.19	77	0.43

**Appendix 3**

PROCESSED: 07:14:02 JUN 6, 1991  
 PERIOD OF ANALYSIS: 5- 1-91 TO 5-31-91  
 PAIR TYPE: EPA:MFR

COMMENTS: MAY PAIRED DATA--LAST ONLY

SIGNED DIFFERENCES: (MFR - EPA)																			
- GASOLINE ONLY -																			
HC				CO				CO <sub>2</sub>				NOX				MPG			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV		
20	CHRYS	21	0.002	21	0.013	21	0.04	0.12	21	0.5	9.2	21	-0.045	0.071	21	0.09	0.50		
30	FORD	18	-0.002	18	0.008	18	0.03	0.07	18	-2.9	4.0	18	-0.091	0.170	18	0.36	0.30		
40	GM	27	0.004	27	0.022	27	0.06	0.32	27	1.5	5.8	27	-0.049	0.087	27	0.07	0.75		
220	FERRA	1	0.000	0	0.000	1	0.12	0.00	1	20.4	0.0	1	0.007	0.000	1	-0.55	0.00		
290	ISUZU	2	0.012	0	0.010	2	0.14	0.21	2	-1.6	0.8	2	0.062	0.059	2	0.68	0.34		
380	NISSN	7	0.024	0	0.024	7	0.17	0.21	7	4.1	6.1	7	0.020	0.034	7	-0.37	0.81		
410	PEUGT	2	0.002	0	0.004	2	-0.04	0.07	2	-8.6	1.3	2	0.023	0.073	2	0.78	0.21		
490	MITSH	3	0.027	0	0.009	3	0.09	0.01	3	10.4	2.4	3	-0.004	0.018	3	-0.78	0.37		
560	MZM	10	-0.006	0	0.024	10	0.05	0.15	10	11.0	4.6	10	0.122	0.228	10	-1.32	1.21		
570	TOYOT	1	0.024	0	0.000	1	0.17	0.00	1	10.9	0.0	1	0.006	0.000	1	-0.98	0.00		
600	VOLVO	3	-0.002	0	0.004	3	0.01	0.01	3	-3.5	1.4	3	0.006	0.050	3	0.56	0.19		
ALL		95	0.004	0	0.019	95	0.06	0.20	95	1.8	7.7	95	-0.025	0.132	95	-0.05	0.84		

卷之三

**PERCENT DIFFERENCES:**  $((\text{MFR} - \text{EPA}) / \text{EPA}) \times 100\%$

	HC	CO	CO2	NOX	MPG							
	NUM	AVG	STDEV	NUM	Avg	STDEV	NUM	Avg	STDEV	NUM	Avg	STDEV
20	CHRRYS	21	6.5	37.8	21	54.9	97.7	21	0.39	21	21.0	26.5
30	FORD	18	-0.0	22.1	18	30.6	103.5	18	-0.83	1.08	18	-11.4
40	GM	27	4.6	40.7	27	58.7	131.0	27	0.64	2.13	27	-25.1
220	FERRA	1	0.0	0.0	1	600.0	0.0	1	4.70	0.00	1	20.0
290	ISUZU	2	49.9	36.9	2	40.6	198.9	2	-0.60	0.44	2	375.0
380	NISSAN	7	30.0	32.6	7	18.5	36.1	7	1.68	2.35	7	48.0
410	PEUGT	2	16.7	23.6	2	-8.7	15.4	2	-3.01	0.61	2	6.3
490	MITSH	3	65.9	15.8	3	95.2	66.4	3	4.02	0.99	3	8.9
560	MZM	10	77.1	172.0	10	302.9	419.3	10	4.77	2.67	10	53.0
570	TOYOT	1	38.7	0.0	1	89.5	0.0	1	4.32	0.00	1	0.0
600	VOLVO	3	-17.3	23.1	3	11.1	19.2	3	-1.34	0.54	3	5.0

卷之三

卷之三

## DATA AND DIFFERENCES:

```

*****
* PAIRED DATA ANALYSIS SUMMARY STATISTICS *
*****
```

EEEEEE	V	V	AAA	PPPP	DDDD	AAA	TTTT	AAA
E	V	V	A	A	P	D	A	A
EEE	V	V	AAAAA	PPP	D	D	AAAAA	T
E	V	V	A	A	P	D	A	A
EEEEEE	V	V	A	A	P	D	A	A
DDDD	A	A	TTTT	A	A	AAA	T	A
D	D	D	A	A	A	AAAAA	A	A
D	D	D	T	T	T	T	A	A
D	D	D	A	A	A	A	A	A

EPA																			
(M-E)					(M-E)/E														
GM/TEST			DIURNAL		H-SOAK			TOTAL											
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM										
20	CHRYS	1	1.03	0.00	1	-0.27	0.00	-0.20	0.00	1	-0.47	0.00	-45.6	0.0	-24.1	27.4	2	20.5	
30	FORD	2	1.11	0.37	2	-0.31	0.42	2	-0.01	0.03	2	-0.32	0.40	8	8.3	14.9	8	18.8	
40	GM	8	0.64	0.31	8	0.01	0.08	8	0.04	0.06	8	0.05	0.13	8	0.0	0.0	1	19.0	
220	FERRA	1	0.32	0.00	1	-0.02	0.00	1	0.02	0.00	1	0.00	0.00	1	0.0	0.0	1	21.0	
290	ISUZU	1	0.54	0.00	1	-0.02	0.00	1	0.19	0.00	1	0.17	0.00	1	31.5	0.0	0.0	0.0	
380	NISSN	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0.0	0.0	
410	PEUGT	1	1.49	0.00	1	-0.05	0.00	1	-0.34	0.00	1	-0.39	0.00	1	-26.2	0.0	1	21.0	
490	MITSH	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0.0	0.0	
560	MZM	1	0.81	0.00	1	-0.23	0.00	1	0.16	0.00	1	-0.07	0.00	1	-8.6	0.0	1	18.0	
600	VOLVO	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.0	0.0	0.0	0.0	
ALL			TOTAL					% DIFF		EPA SOAK					SOAK			EPA SOAK	
BY SHED:			(EPA TESTS)					AVG		STDEV					AVG			STDEV	
*****			AVG					STDEV		AVG					STDEV			STDEV	
S001	3	0.57	0.40	3	-0.10	0.15	3	-0.05	0.13	3	-0.14	0.28	3	-11.5	30.1	3	20.7	1.5	
S002	8	0.90	0.44	8	-0.07	0.23	8	-0.01	0.14	8	-0.08	0.29	8	-2.8	23.9	8	19.0	3.4	
S003	2	0.65	0.22	2	-0.09	0.19	2	0.11	0.08	2	0.01	0.11	2	4.7	18.8	2	18.5	0.7	
S004	2	0.69	0.21	2	-0.05	0.04	2	0.07	0.16	2	0.03	0.21	2	8.7	32.2	2	20.5	0.7	
ALL	15	0.77	0.38	15	-0.07	0.18	15	0.01	0.13	15	-0.07	0.25	15	-2.0	23.6	15	19.5	2.6	

## Appendix 5

PROCESSED: 07:14:02 JUN 6, 1991  
 PERIOD OF ANALYSIS: 5- 1-91 TO 5-31-91  
 PAIR TYPE: EPA:MFR

COMMENTS: MAY PAIRED DATA--LAST ONLY

COASTDOWN DATA:  
 \*\*\*\*\*

	MFR TRK			MFR QCHK			EPA QCHK			(MFR-EPA)			((M-E)/E)%			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV		
20	CHRYS	13.34	4.78	21	13.17	4.75	21	13.17	4.72	21	-0.00	0.28	21	-0.06	1.86	
30	FORD	14.12	4.17	18	13.96	4.02	18	13.97	4.04	18	-0.01	0.29	18	0.00	1.73	
40	GM	15.44	2.04	27	15.70	1.91	27	15.49	1.82	27	0.21	0.53	27	1.38	3.33	
220	FERRA	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00	
290	ISUZU	12.00	0.74	2	12.35	0.95	2	11.81	0.29	2	0.54	0.66	2	4.46	5.46	
380	NISSN	14.41	0.99	7	14.43	0.99	7	14.47	1.27	7	-0.04	0.64	7	-0.05	4.45	
410	PEUGT	13.16	0.74	2	13.11	0.63	2	13.36	0.88	2	-0.24	0.25	2	-1.78	1.74	
490	MITSH	14.22	0.80	3	14.05	0.43	3	14.17	0.61	3	-0.11	0.35	3	-0.75	2.41	
560	MZM	15.84	1.57	10	15.78	1.46	10	15.91	1.87	10	-0.13	0.48	10	-0.56	2.86	
570	TOYOT	14.26	0.00	1	13.22	0.00	1	13.82	0.00	1	-0.60	0.00	1	-4.34	0.00	
600	VOLVO	15.03	0.58	3	15.41	0.43	3	15.49	0.53	3	-0.08	0.29	3	-0.51	1.86	
ALL		95	14.34	3.56	95	14.35	3.53	95	14.31	3.53	95	0.03	0.44	95	0.29	2.85

- GASOLINE TESTS -

**Appendix 6**

PROCESSED: 07:14:01 JUN 6, 1991  
 PERIOD OF ANALYSIS: 5- 1-91 TO 5-31-91  
 PAIR TYPE: EPA:MFR

COMMENTS: MAY PAIRED DATA--LAST ONLY

SIGNED DIFFERENCES: ( MFR - EPA )

- ALL FUELS -

TP	SITE	HC			CO			CO2			NOX			MPG			COUNT BY MFR GROUP				
		NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	AMC	CHR	FRD	GM	OTHr
FTP	D001	18	0.012	0.040	18	-0.14	0.68	18	2.72	17.25	18	-0.039	0.075	18	-0.00	0.58	0	3	4	5	6
	D002	17	-0.010	0.051	17	-0.11	0.56	17	-0.58	12.65	17	-0.015	0.089	17	0.11	0.54	0	1	2	9	5
	D003	11	0.022	0.036	11	0.06	0.26	11	12.50	15.91	11	-0.017	0.074	11	-0.38	0.66	0	2	1	2	6
	D004	15	0.016	0.036	15	0.01	0.26	15	1.34	15.34	15	-0.052	0.098	15	0.00	0.66	0	3	4	2	6
	D005	5	-0.041	0.027	5	-0.84	0.64	5	-2.96	13.54	5	-0.019	0.049	5	0.46	0.70	0	2	0	3	0
	D006	11	0.022	0.029	11	0.03	0.55	11	-3.53	10.75	11	-0.027	0.102	11	0.25	0.34	0	6	0	1	4
	D007	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
HWFE	ALL	77	0.007	0.042	77	-0.10	0.54	77	1.86	15.01	77	-0.030	0.084	77	0.04	0.60	0	17	11	22	27
	A001	35	0.001	0.047	35	-0.13	0.61	35	1.12	15.06	35	-0.028	0.082	35	0.05	0.56	0	4	6	14	11
	A002	26	0.018	0.035	26	0.03	0.26	26	6.06	16.27	26	-0.037	0.089	26	-0.16	0.67	0	5	5	4	12
	A003	16	0.002	0.041	16	-0.24	0.70	16	-3.35	11.22	16	-0.024	0.087	16	0.32	0.46	0	8	0	4	4
	A004	0	0.000	0.000	0	0.00	0.00	0	0.00	0.00	0	0.000	0.000	0	0.00	0.00	0	0	0	0	0
	D001	18	-0.003	0.019	18	0.00	0.11	18	-2.06	8.29	18	-0.079	0.129	18	0.27	0.66	0	3	6	4	5
	D002	20	-0.001	0.016	20	0.07	0.24	20	-0.18	6.76	20	-0.017	0.125	20	0.13	0.82	0	3	4	9	4
D003	17	0.007	0.023	17	0.07	0.19	17	4.84	8.01	17	0.013	0.187	17	-0.32	1.03	0	3	4	3	7	
D004	15	0.007	0.022	15	0.08	0.31	15	3.93	7.87	15	-0.040	0.157	15	-0.31	0.90	0	2	3	4	6	
D005	9	0.008	0.019	9	0.06	0.07	9	-0.37	6.77	9	-0.016	0.062	9	0.19	0.57	0	2	1	4	2	
D006	14	0.007	0.011	14	0.05	0.12	14	3.30	5.53	14	-0.000	0.048	14	-0.23	0.81	0	6	0	3	5	
D007	2	0.008	0.005	2	0.28	0.28	2	12.55	0.07	2	-0.041	0.042	2	-0.29	0.04	0	2	0	0	0	
ALL	95	0.004	0.019	95	0.06	0.20	95	1.77	7.70	95	-0.025	0.132	95	-0.05	0.84	0	21	18	27	29	
A001	38	-0.002	0.017	38	0.04	0.19	38	-1.07	7.48	38	-0.046	0.129	38	0.20	0.74	0	6	10	13	9	
A002	32	0.007	0.022	32	0.07	0.25	32	4.41	7.83	32	-0.011	0.173	32	-0.31	0.96	0	5	7	7	13	
A003	23	0.008	0.014	23	0.05	0.10	23	1.87	6.17	23	-0.007	0.053	23	-0.07	0.74	0	8	1	7	7	
A004	2	0.008	0.005	2	0.28	0.28	2	12.55	0.07	2	-0.041	0.042	2	-0.29	0.04	0	2	0	0	0	
ALL	95	0.004	0.019	95	0.06	0.20	95	1.77	7.70	95	-0.025	0.132	95	-0.05	0.84	0	21	18	27	29	

**Appendix 6-b**

PROCESSED: 07:14:01 JUN 6, 1991  
 PERIOD OF ANALYSIS: 5-1-91 TO 5-31-91  
 PAIR TYPE: EPA:MFR

## COMMENTS: MAY PAIRED DATA--LAST ONLY

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100%

- ALL FUELS -

*****												*****												*****											
PAIRED DATA ANALYSIS				SUMMARY STATISTICS				PAIRS				COUPLES				TOTALS				INDIVIDUALS				EQUIVALENTS											
TP	SITE	HC	CO	CO2	NOX	MPG	COUNT BY MFR GROUP	AMC	CHR	FRD	GM	OTH	TP	SITE	HC	CO	CO2	NOX	MPG	COUNT BY MFR GROUP	AMC	CHR	FRD	GM	OTH										
FTP	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	FTP	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV										
D001	18	8.2	21.9	18	9.3	33.2	18	0.90	3.39	18	-5.3	19.9	18	0.28	3.20	0	3	4	5	6	0	3	4	5	6	0									
D002	17	-0.2	21.0	17	1.0	30.0	17	0.08	2.72	17	-3.4	30.6	17	0.82	2.53	0	1	2	9	5	0	1	2	9	5	0									
D003	11	-17.1	25.9	11	18.5	35.2	11	2.99	3.32	11	-2.6	20.1	11	-1.55	3.08	0	2	1	2	6	0	2	1	2	6	0									
D004	15	11.4	25.6	15	4.8	16.6	15	0.62	3.59	15	-3.8	28.3	15	0.32	3.09	0	3	4	2	6	0	3	4	2	6	0									
D005	15	-16.2	7.9	5	-29.0	15.0	5	-0.68	2.91	5	1.3	22.3	5	2.12	3.24	0	2	0	3	0	0	2	0	3	0	0									
D006	11	10.7	15.2	11	4.2	26.8	11	-0.56	2.10	11	-0.0	42.6	11	1.42	1.96	0	6	0	1	4	0	6	0	1	4	0									
D007	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0	0	0	0	0	0										
ALL	77	7.0	22.6	77	4.7	29.4	77	0.65	3.19	77	-2.3	27.6	77	0.43	2.94	0	17	11	22	27	0	17	11	22	27	0									
A001	35	4.2	21.5	35	5.2	31.5	35	0.50	3.06	35	-4.4	25.3	35	0.54	2.86	0	4	6	14	11	0	4	6	14	11	0									
A002	26	13.8	25.3	26	10.6	26.4	26	1.62	3.61	26	-1.1	24.9	26	-0.47	3.16	0	5	5	4	12	0	5	5	4	12	0									
A003	16	2.3	18.3	16	-6.2	28.2	16	-0.60	2.28	16	0.4	36.7	16	1.64	2.34	0	8	0	4	4	4	0	8	0	4	4	0								
A004	0	0.0	0.0	0	0.0	0.0	0	0.00	0.00	0	0.0	0.0	0	0.00	0.00	0	0	0	0	0	0	0	0	0	0										
HWFE	ALL	77	7.0	22.6	77	4.7	29.4	77	0.65	3.19	77	-2.3	27.6	77	0.43	2.94	0	17	11	22	27	0	17	11	22	27	0								
D001	18	26.5	112.5	18	81.6	228.1	18	-0.28	2.39	18	36.8	218.4	18	1.21	2.19	0	3	6	4	5	0	3	6	4	5	0									
D002	20	11.7	78.6	20	118.6	220.7	20	0.18	2.44	20	-8.7	62.6	20	0.77	2.34	0	3	4	9	4	0	3	4	9	4	0									
D003	17	14.3	37.3	17	110.5	253.8	17	1.85	2.97	17	80.6	232.4	17	-0.71	2.62	0	3	4	3	7	0	3	4	3	7	0									
D004	15	17.8	48.1	15	35.4	86.7	15	1.65	3.01	15	46.8	190.0	15	-0.69	2.59	0	2	3	4	6	0	2	3	4	6	0									
D005	9	9.4	42.6	9	73.6	173.5	9	0.11	2.07	9	46.8	204.0	9	0.78	1.92	0	2	1	4	2	0	2	1	4	2	0									
D006	14	16.8	33.0	14	29.7	63.0	14	1.36	2.27	14	32.8	180.5	14	-0.45	2.06	0	6	0	3	5	0	6	0	3	5	0									
D007	2	10.0	0.3	2	96.4	75.8	2	2.57	0.03	2	-22.1	5.8	2	-1.64	0.22	0	2	0	0	0	0	2	0	0	0	0									
ALL	95	16.4	66.7	95	79.2	188.9	95	0.84	2.63	95	35.8	181.5	95	0.13	2.40	0	21	18	27	29	0	21	18	27	29	0									
A001	38	18.7	95.1	38	101.0	222.0	38	-0.04	2.40	38	12.9	156.4	38	0.98	2.25	0	6	10	13	9	0	6	10	13	9	0									
A002	32	15.9	42.0	32	75.3	195.1	32	1.75	2.94	32	64.8	210.9	32	-0.70	2.57	0	5	7	7	13	0	5	7	7	13	0									
A003	23	13.9	36.3	23	46.9	117.4	23	0.87	2.23	23	38.3	185.6	23	0.03	2.06	0	8	1	7	7	0	8	1	7	7	0									
A004	2	10.0	0.3	2	96.4	75.8	2	2.57	0.03	2	-22.1	5.8	2	-1.64	0.22	0	2	0	0	0	2	0	0	0	0										
ALL	95	16.4	66.7	95	79.2	188.9	95	0.84	2.63	95	35.8	181.5	95	0.13	2.40	0	21	18	27	29	0	21	18	27	29	0									

卷之三

**Appendix 7-b**

PROCESSED: 07:14:02 JUN 6, 1991  
 PERIOD OF ANALYSIS: 5- 1-91 TO 5-31-91  
 PAIR TYPE: EPA:MFR

COMMENTS: MAY PAIRED DATA--LAST ONLY  
 PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE												ALL OTHERS											
RANDOM AUDIT				FAILURE AT MFR				FE UP BY 1 OR MORE				NEW VEHICLE				FE CORR OFFSET				ALL OTHERS			
NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV	NUM	AVG	STDEV
20	CHRYRS	9	0.90	1.34	0	0.00	0.00	6	0.52	2.77	0	0.00	0.00	0.00	0	0.00	0.00	6	-0.02	2.61	R	RRRR	FFFF
30	FORD	7	2.03	1.28	0	0.00	0.00	6	1.17	0.55	0	0.00	0.00	0.00	0	0.00	0.00	5	0.88	1.00	R	RRRR	FFFF
40	GM	4	1.16	0.53	1	0.35	0.00	1	-1.02	0.00	1	0.03	0.00	0.00	0	0.00	0.00	20	0.44	2.46	C	CCCC	CCCC
220	FERRA	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	R	R	R
290	ISUZU	2	2.08	0.45	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	R	R	R
380	NISSN	4	-0.89	2.79	0	0.00	0.00	1	1.64	0.00	0	0.00	0.00	0.00	0	0.00	0.00	2	-2.49	0.07	F	FFFF	CCCC
410	PEUGT	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	R	R	R
490	MITSH	3	-2.28	1.01	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	R	R	R
560	MZM	1	-5.61	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	4	-4.63	2.38	0	0.00	0.00	C	CCCC	CCCC
570	TOYOT	1	-2.80	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	5	-1.61	1.71	F	FFFF	CCCC
600	VOLVO	2	1.84	0.71	0	0.00	0.00	0	0.00	0.00	1	1.35	0.00	0.00	0	0.00	0.00	0	0.00	0.00	R	R	R
ALL		33	0.48	2.22	1	0.35	0.00	14	0.77	1.86	9	-1.64	3.55	0	0.00	0.00	38	0.00	2.31				

\*\*\*\*\*  
 \* PAIRED DATA ANALYSIS \*  
 \* SUMMARY STATISTICS \*

\*  
 \*\*\*\*\*



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
ANN ARBOR, MICHIGAN 48105

MER  
A-91-46  
IV-B-2

June 18, 1991

OFFICE OF  
AIR AND RADIATION

MEMORANDUM

SUBJECT: Monthly Paired Data - April 1991

FROM: Robert K. Gilkey, Engineer  
Correlation & Engineering Services

TO: Eldert Bontekoe, Team Leader  
Certification Branch

THRU: Martin Reineman, Manager *MR*  
Correlation and Engineering Services

This report presents the paired data for April, 1991. Attachment A presents the Monthly Paired Data Status Graphs, while Attachment B presents paired differences of fuel economy and quickcheck coastdown times between EPA and selected individual manufacturers. Attachment C details the methods used to prepare the graphs and summaries used for this analysis. The paired data summary statistics are presented in the Appendix.

Conclusions:

1. Overall running averages for FTP and HFET fuel economy percent differences continue near zero and FTP emission offsets continue to be acceptable.
2. Ford continues to show small but statistically significant offsets in both FTP and HFET fuel economy results. These trends have been demonstrated for over six months and a special correlation program will be used to help determine the cause for these differences.

Discussion:

Attachment A shows acceptable overall FTP emission running averages. CO and Evap monthly means changed signs after long periods of slight directional biases.

Both the FTP and HFET MPG running averages remain near zero and are acceptable. Monthly means continue to oscillate around zero.

-2-

Selected Manufacturers Results:

Attachment B shows that Ford and Chrysler maintained their positive FTP MPG biases. The Ford FTP results for the month are statistically significant while the Chrysler difference is not. Ford also continued its positive HFET MPG bias while Chrysler does not show a trend.

No other significant trends or deviations are evident and, excepting Ford, the percent differences in Attachment B are acceptable.

Paired Data Summary Statistics:

The following test data was excluded from the summary statistics calculations in the Appendix:

April Paired Data Rejected for Exceeding Screening Limits

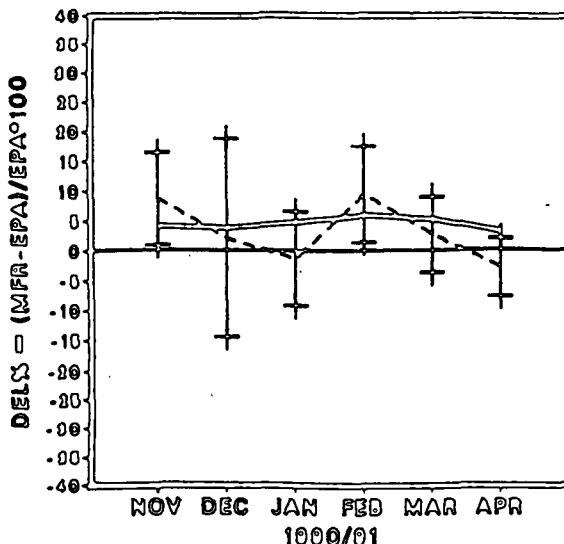
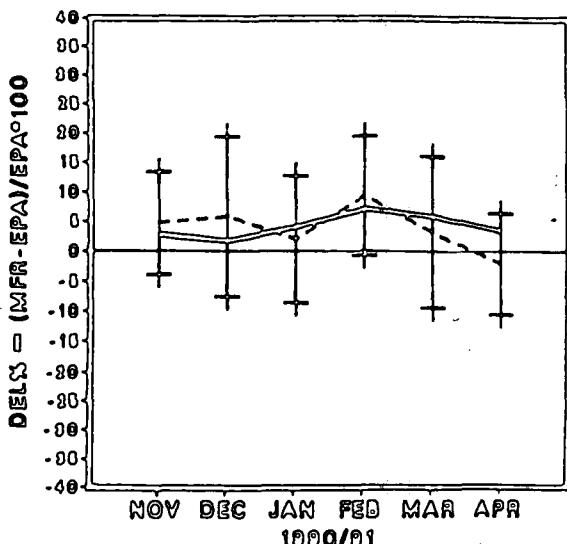
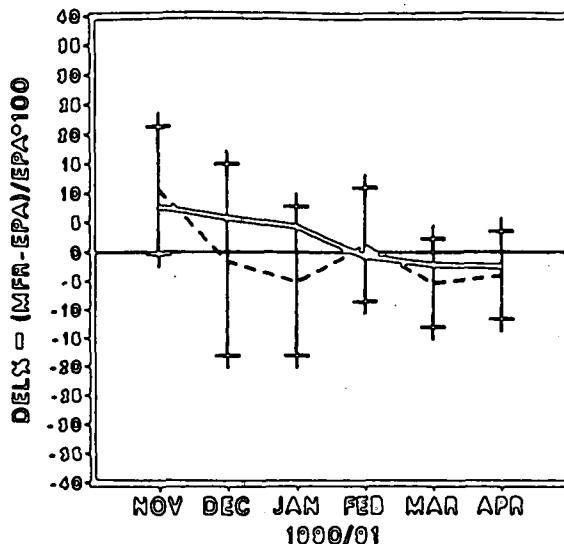
<u>Mfr</u>	<u>Vehicle ID</u>	<u>VI</u>	<u>Parameter</u>	<u>Screening Limit</u>	<u>Test Result</u>	<u>EPA Value</u>
Mitsu	EF2-Z730	0	%NOx	+100%	+159%	0.170
Lipht.	52499	0	%NOx	+100%	+414%	0.109

If I can be of further assistance, please call on x397.

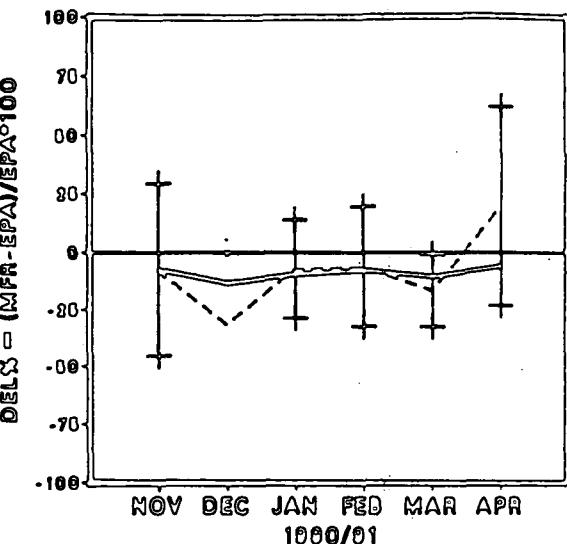
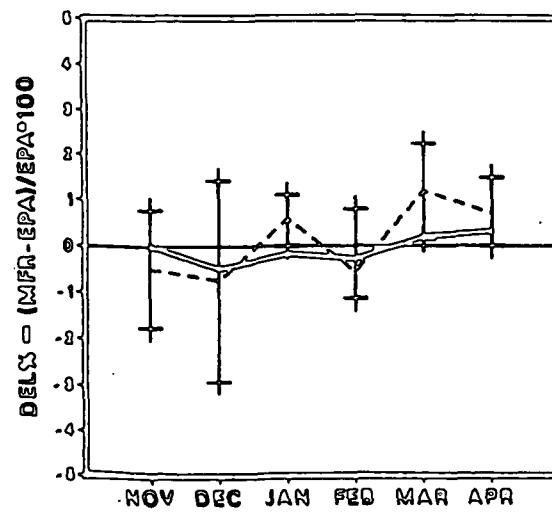
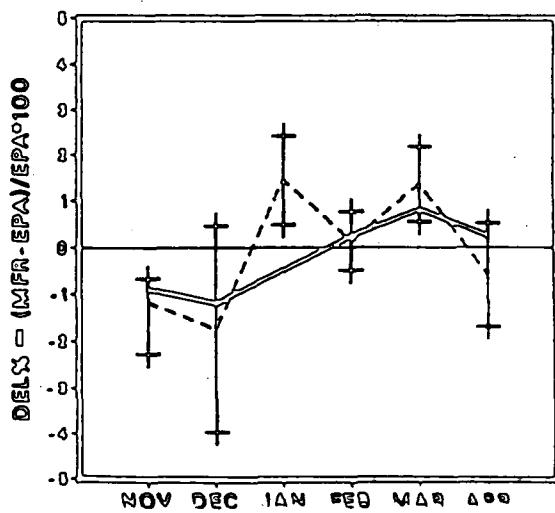
Attachments

cc: R. Lawrence  
J.T. White  
J. Carpenter  
P. Reece  
D. Danyko  
D. Perkins  
T. Schrodт  
M. Caldwell

**ATTACHMENT A**  
**Engineering Operations Division**  
**Monthly Paired Data Status Graphs**

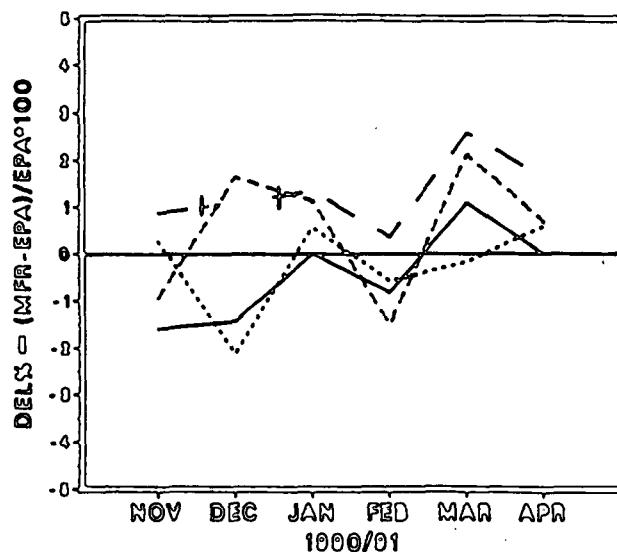
**FTP HC****FTP CO****FTP NOX**

**Legend**  
MONTHLY MEAN ...  
RUNNING AVERAGE  
+ = 95% Confidence Interval

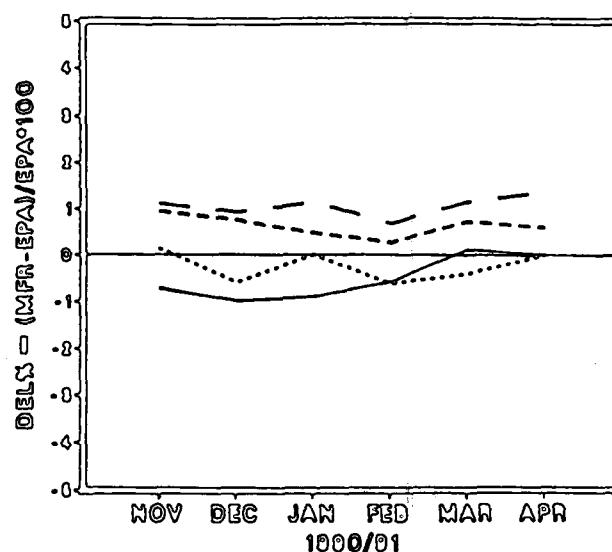
**EVAPORATIVE EMISSIONS****FTP MPG****HFET MPG**

**ATTACHMENT B**  
**Engineering Operations Division**  
**Manufacturer Paired Data Status Graphs**

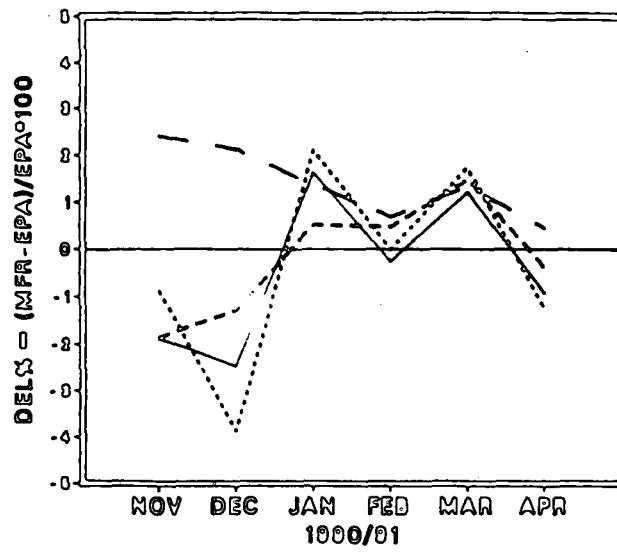
**FTP MPG**  
 MONTHLY MEANS



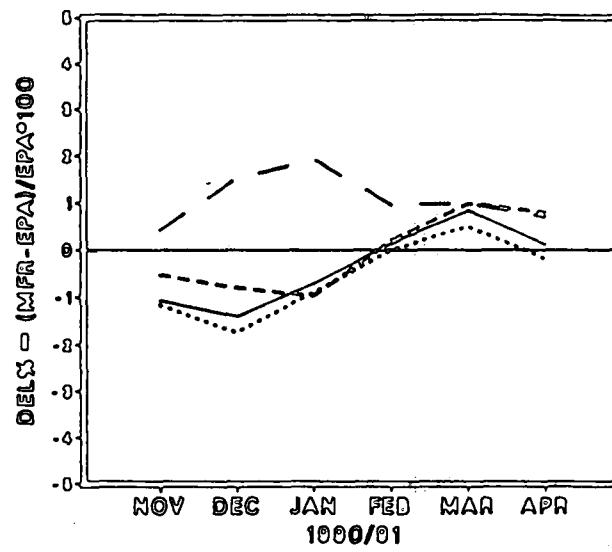
**FTP MPG**  
 THREE MONTH RUNNING AVERAGE



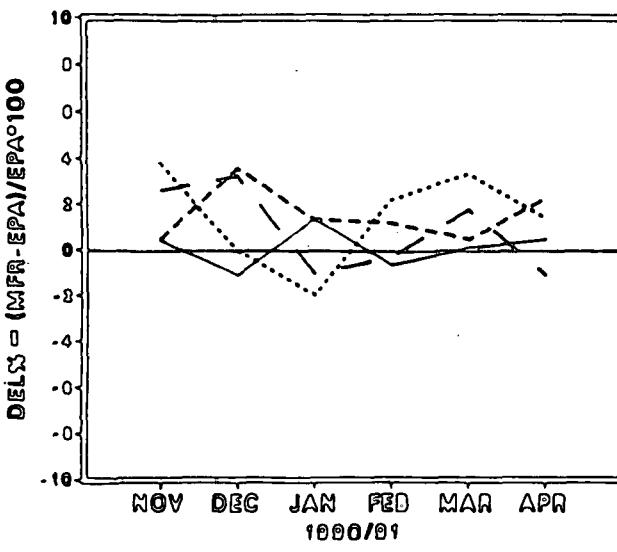
**HFET MPG**  
 MONTHLY MEANS



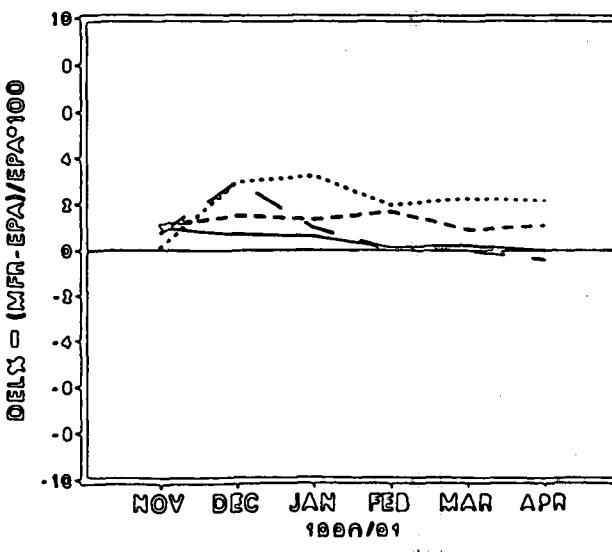
**HFET MPG**  
 THREE MONTH RUNNING AVERAGE



**QUICKCHECK COASTDOWN**  
 MONTHLY MEANS



**QUICKCHECK COASTDOWN**  
 THREE MONTH RUNNING AVERAGE



**Legend**

- GM \_\_\_\_\_
- FORD \_\_\_\_\_
- CHRYSLER \_\_\_\_\_
- OTHER \_\_\_\_\_